Johns-Manville's New Insulating Board Plant September 23, 1957

Paper Trade Journal

Flakt Pulp Drier — Swedish mill finds many advantages in new compactly built drier.

Continuous Starch Cooking — A mill reports advantages of this method for stock furnish.

Groundwood Production — Dr. Klemm's thorough discussion of its theoretical aspects.

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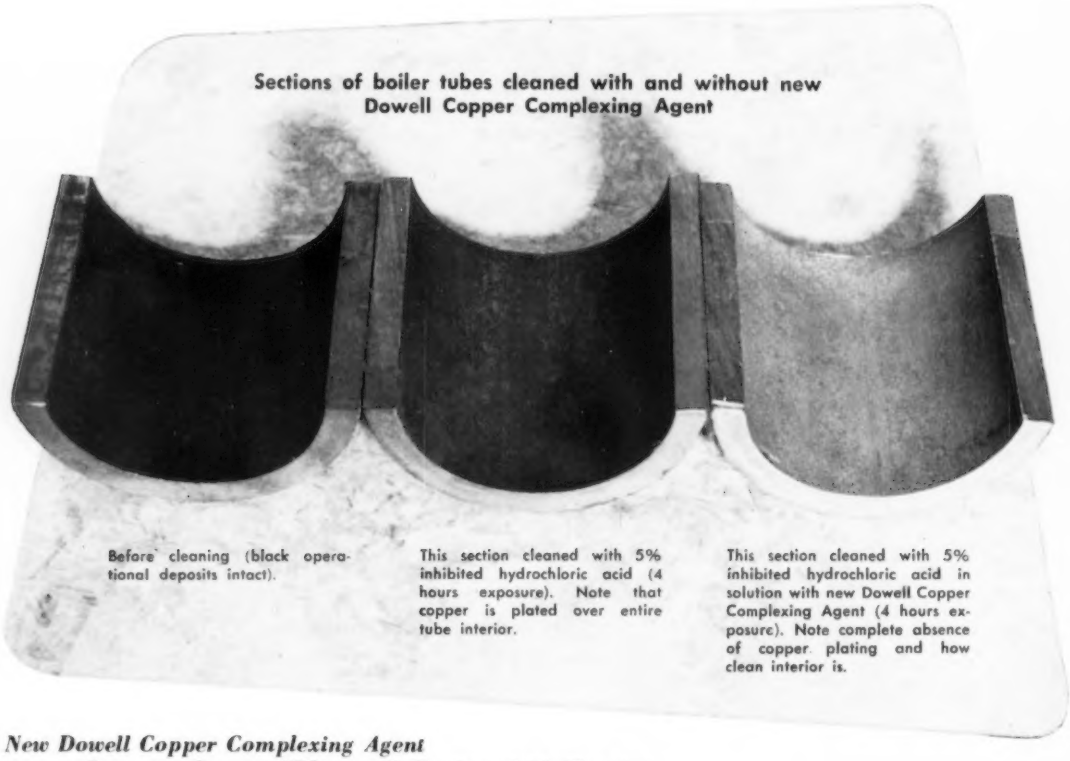
New single-stage chemical cleaning service removes copper, water-formed scale from boilers

Sections of boiler tubes cleaned with and without new Dowell Copper Complexing Agent



Before cleaning (black operational deposits intact).

This section cleaned with 5% inhibited hydrochloric acid (4 hours exposure). Note that copper is plated over entire tube interior.

This section cleaned with 5% inhibited hydrochloric acid in solution with new Dowell Copper Complexing Agent (4 hours exposure). Note complete absence of copper plating and how clean interior is.

New Dowell Copper Complexing Agent Prevents Copper "Plate-out" During Acid Cleaning

Dowell research has solved the problem of removing copper deposits, along with iron oxides and other water-formed deposits, in a *single-stage*, acid-fill boiler cleaning job. This single-stage chemical cleaning is made possible by a new copper-complexing agent*. When added to Dowell's regular cleaning solvents, this agent acts to dissolve copper deposits, and to complex copper ions so that they remain in solution in the spent acid and do not plate out on the newly cleaned metal.

Removal of copper from boiler tubes is of prime importance. Galvanic cells may be formed between the copper particles and exposed steel surfaces. Such cells may contribute to pitting during normal operation of the unit. Also copper deposits may interfere with heat transfer, leading to localized over-heating and sudden failure of the boiler tubes by rupture. Freshly plated copper may even slough and cause stoppage of the tubes.

Another distinct advantage of this new single-stage boiler cleaning service is in reduced boiler outage time. Boiler tubes can now be chemically cleaned—removing copper deposits in addition to water-formed scale and sludge in about one-half the time previously required to perform this service.

For complete information on how this new copper-complexing agent can help you, call the Dowell office near you. Or write Dowell Incorporated, Tulsa 1, Oklahoma.

*PATENT PENDING

have Dowell clean it chemically

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News about

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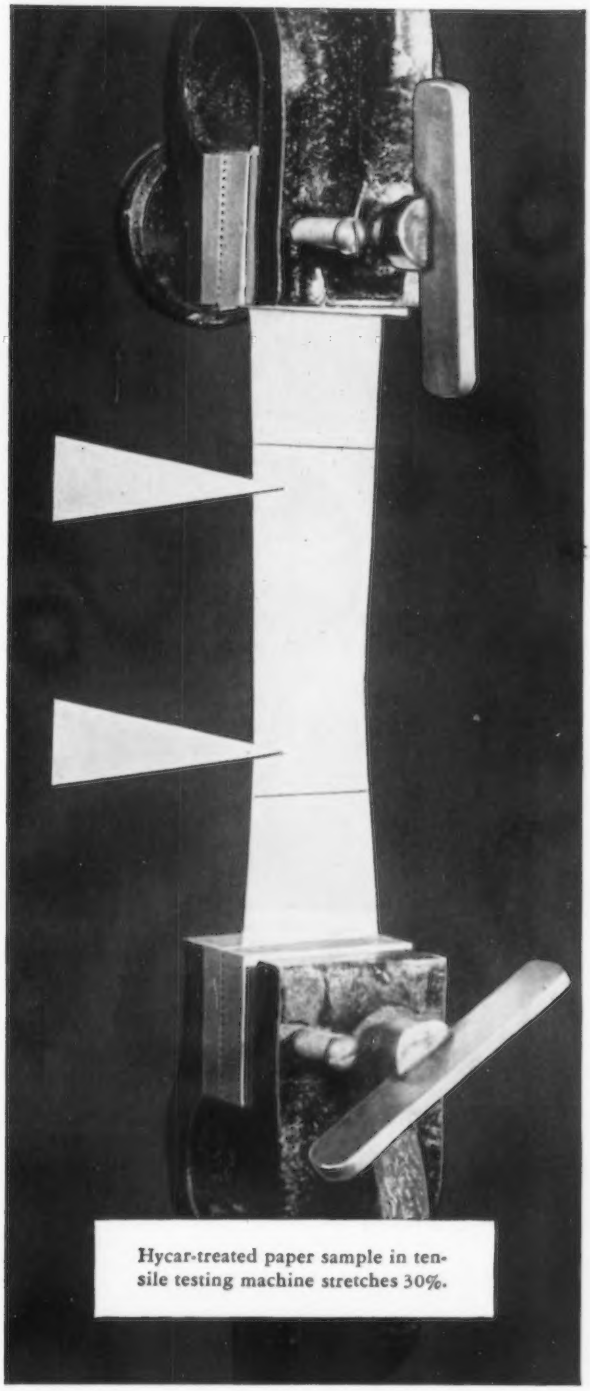

Hycar-treated paper sample in tensile testing machine stretches 30%.

Hycar-treated paper stretches thirty percent

MANY special purpose papers require greater elongation properties. Masking tape stock is a good case in point. Here the paper must have the internal bond to resist de-lamination, plus good elongation. The photograph shows how saturating the base stock paper with Hycar latex builds in the necessary "stretch".

But vastly improved elongation characteristics are only one advantage that this material lends to paper. Hycar also improves tensile and tear strength, wet and dry burst strength, and oil, water and solvent resistance.

Another big job this versatile material does in the paper field is with the wax coated packaging papers. Used as a coating, Hycar resists penetration of the oil and glycol-based inks required for printing food wrappers. Here, Hycar means less ink used, brighter colors—plus increased abrasion resistance, greater strength and flexibility. These attributes add up to making food packages far better salesmen!

As you can see, the applications and advantages of Hycar latices are many and varied. Undoubtedly there's a type available that can add greater sales punch to your product. For further information write Dept. HQ-10, B. F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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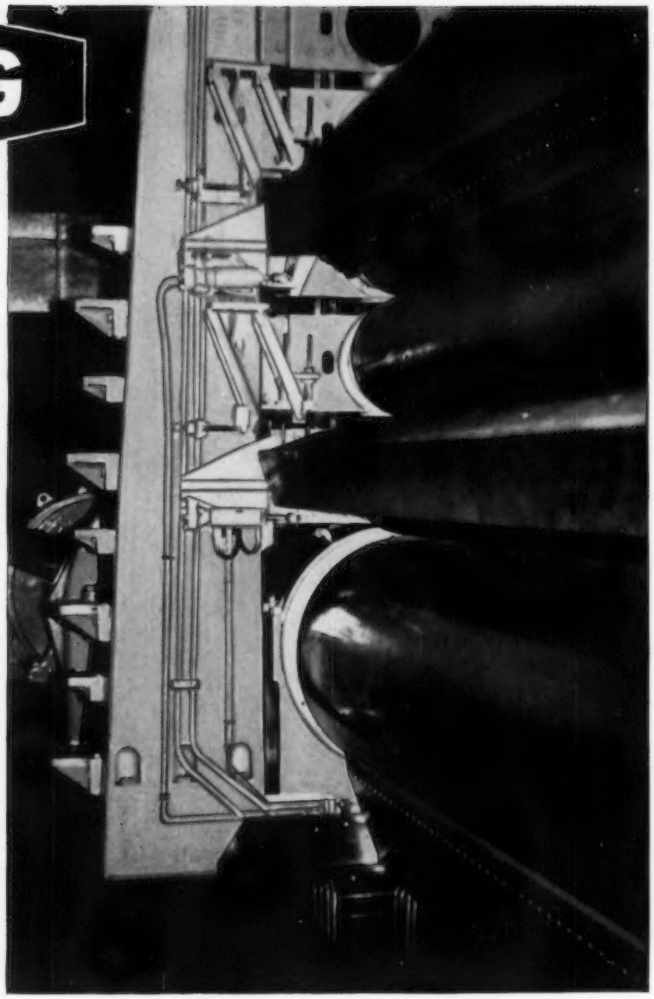

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Published Weekly Since 1872

September 23, 1957, *Vol. 141, No. 38*

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SEPT. 23-26: Engineering Conference at Netherland Hotel, Cincinnati, Ohio.

OCT. 3-4: De-inking Conference at Hotel Niagara, Niagara Falls, N. Y.

OCT. 7-8: Paper Plastics Conference at Sheraton-Gibson Hotel, Cincinnati, Ohio.

OCT. 17-18: Fibre Box Assn. Annual Meeting at Sheraton-Park Hotel, Washington, D. C.

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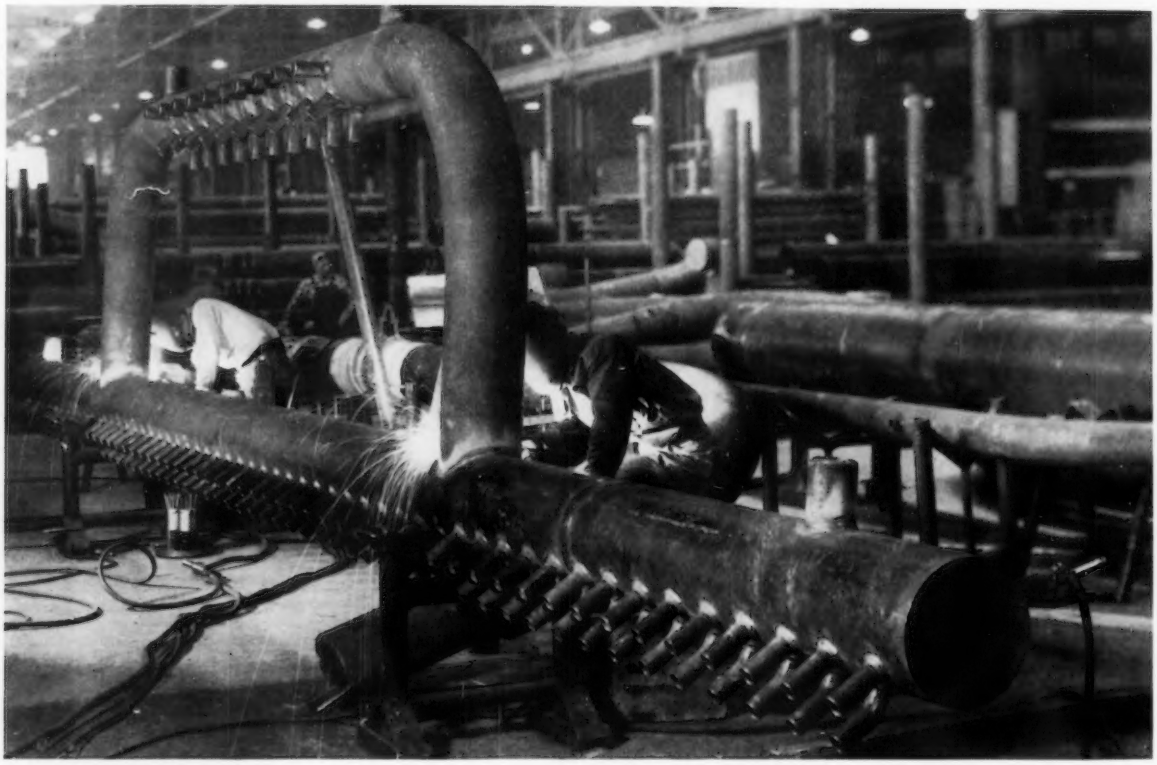
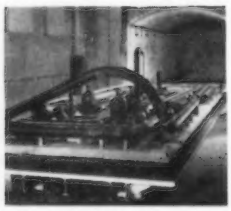


Bending



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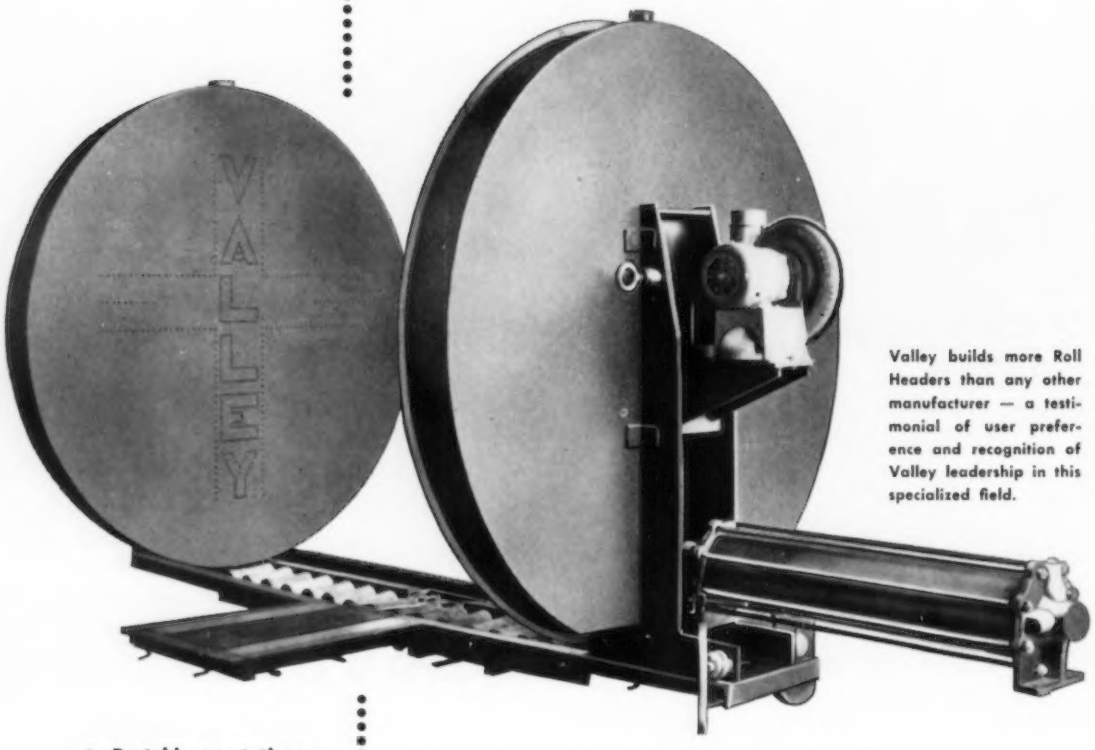

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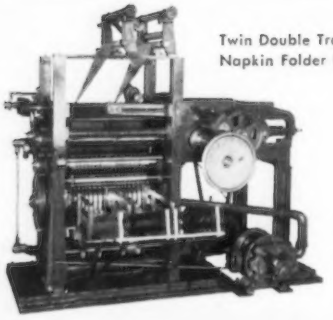
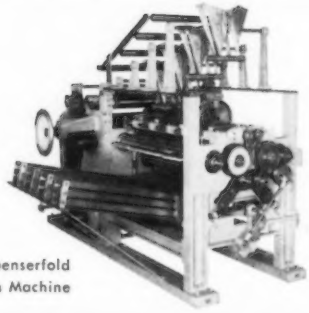


Twin Double Transverse
Napkin Folder for Facial Type Napkins



Super Eight Dispenserfold
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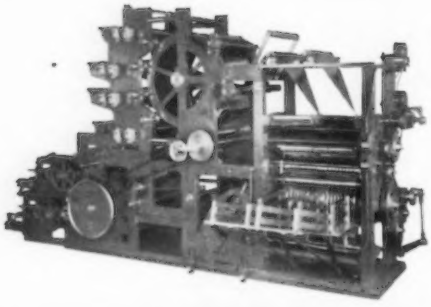
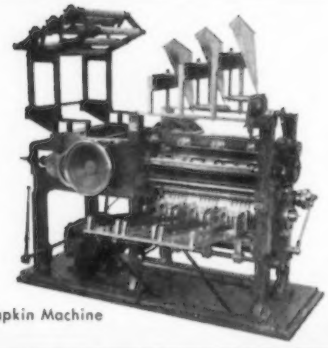
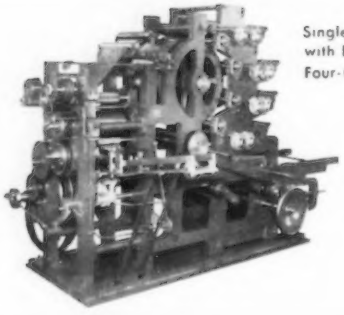


Napkin Machine for
Printed Name Embossed
Double Fold Napkins



Offset Fold Napkin Machine



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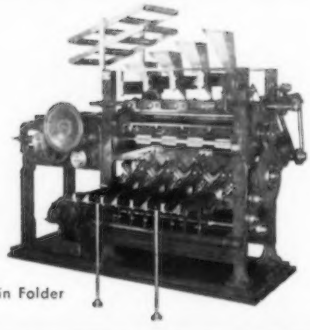

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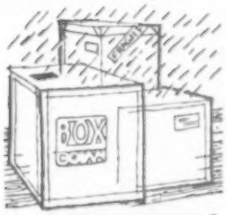

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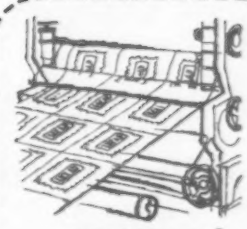

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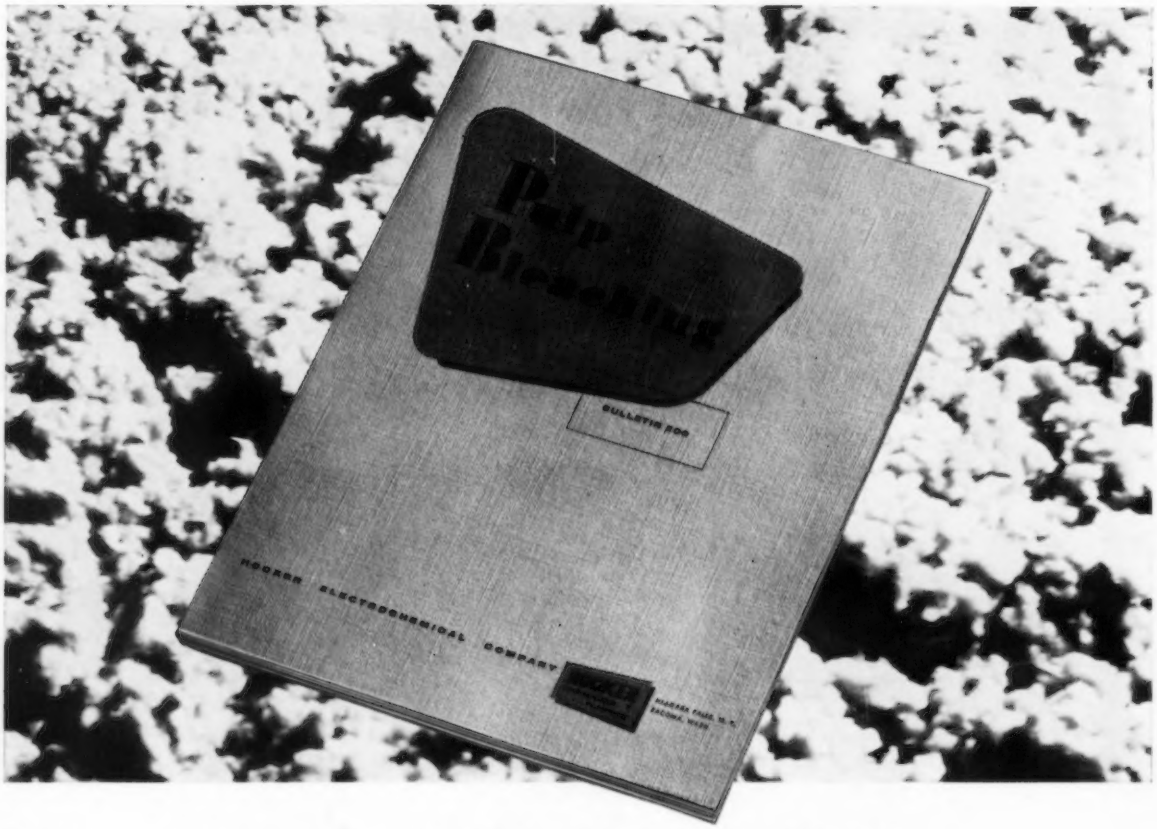

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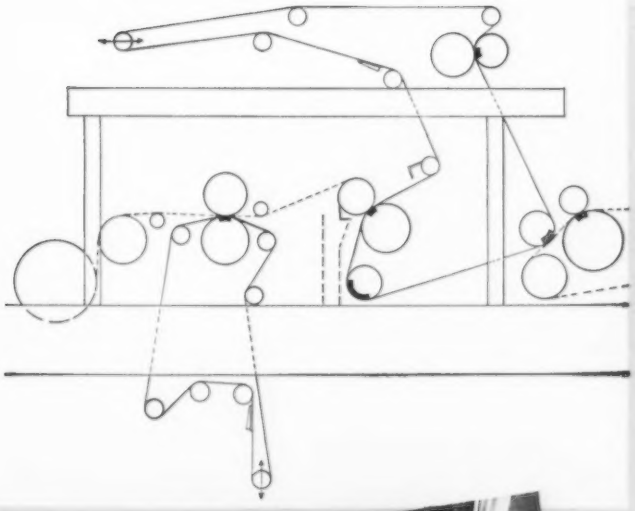

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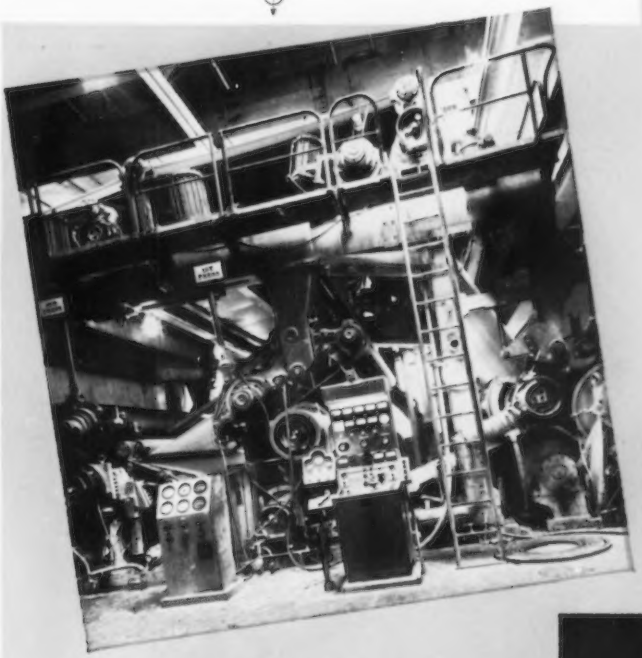

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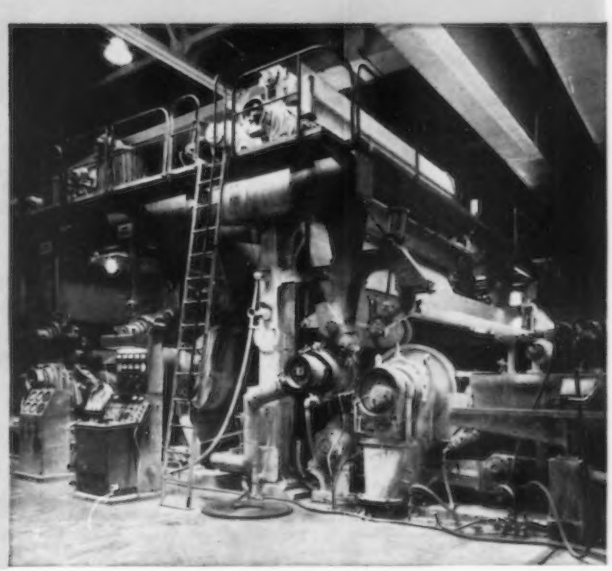

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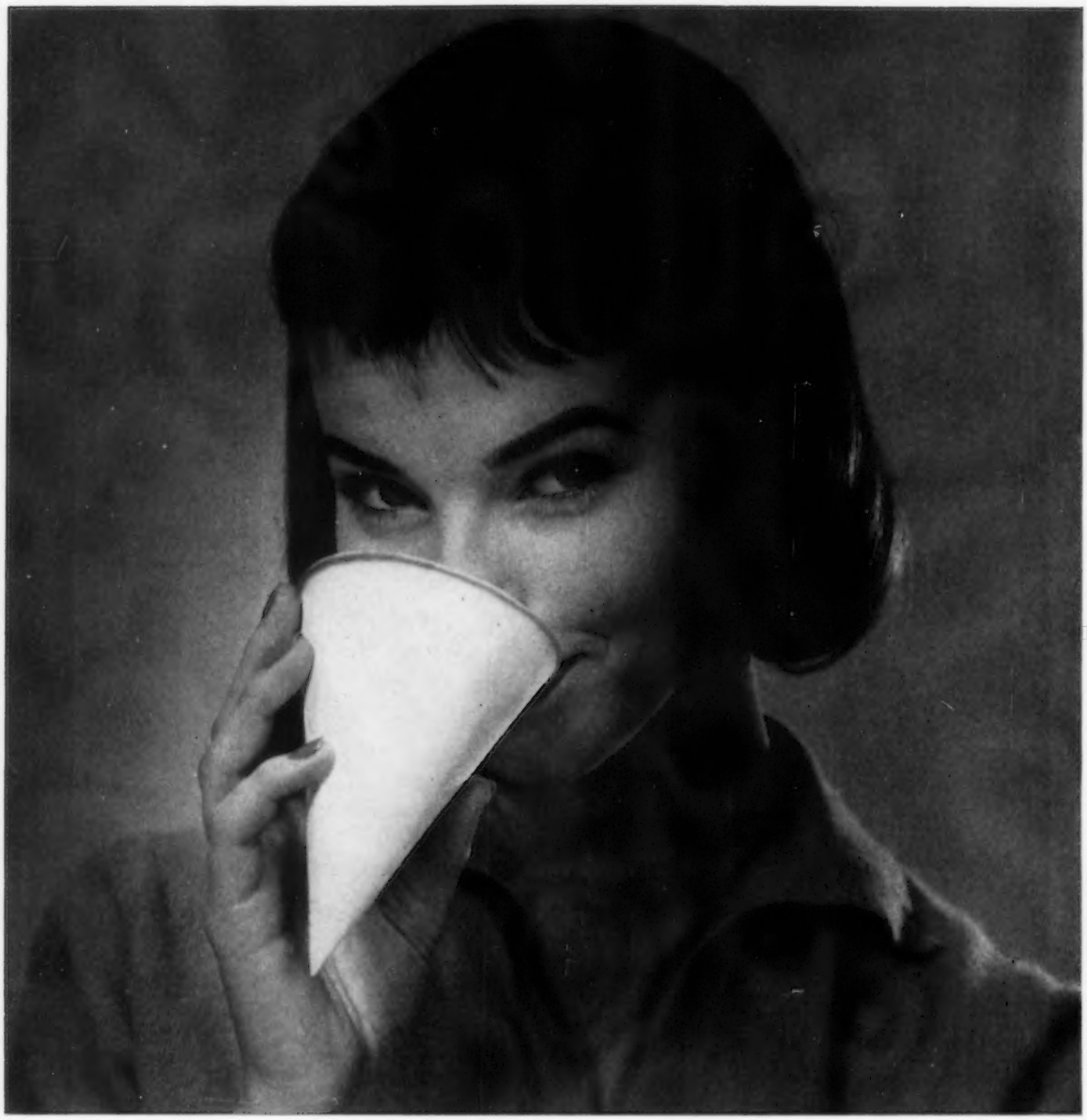

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—to provide these products and services

PIPING SYSTEMS

for all pressures and temperatures

Engineer
—to meet specific requirements

Compute
—piping stress analysis by using digital computer

Prefabricate
—in shop and field
pipe bends • expansion bends
headers • manifolds

Erect
—in field

Send for Bulletin No. 2443—"Piping for Industry"

HANGERS and SUPPORTS

for all types of piping installations

Design
—to meet specific requirements

Manufacture
—to comply with "code for pressure piping"
- functional spring hangers
- constant support spring hangers
- rigid hanger assemblies
- overhead roller assemblies
- supports
- vibration eliminators

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AUTOMATIC SPRINKLER SYSTEMS

for maximum protection against fire

Engineer
—to meet specific conditions

Fabricate
- spray sprinkler systems
- rate-of-rise systems
- CO_2 systems
- water fog equipment
- foam equipment

Install
—to comply with insurance standards and municipal codes

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—"Fire Can Destroy Your Business"

Write us about your requirements for any or all of these products and services. Our experienced engineers will be glad to help you.

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Power Piping and Sprinkler Division
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...lets one man handle work you'd pay a crew to do!

By putting new efficiency, safety and positive control into the hands of Towmotor lift truck operators you enable them to do a *bigger day's work, easier.* You let each one handle jobs you'd normally hire a *gang* to do.

Through modern Towmotor mass-handling each operator has the power to improve your profit picture, because the new Towmotor fork lift trucks multiply their productivity. Look over the new features that operators like best about our latest models—such as:

- New planned-comfort design
- Off-center adjustable seating
- Double action hydraulic tilt
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- Famed 12" reach for all controls

Before you decide on your next fork lift truck, we urge you to get all the facts on the newly-designed Towmotor units. Write to Towmotor Corporation, Cleveland 10, Ohio today and ask for our new illustrated lift truck booklet—No. SP-23.

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Gerlinger Carrier Company, Dallas, Oregon, is a subsidiary of Towmotor Corporation

Forestry...1957

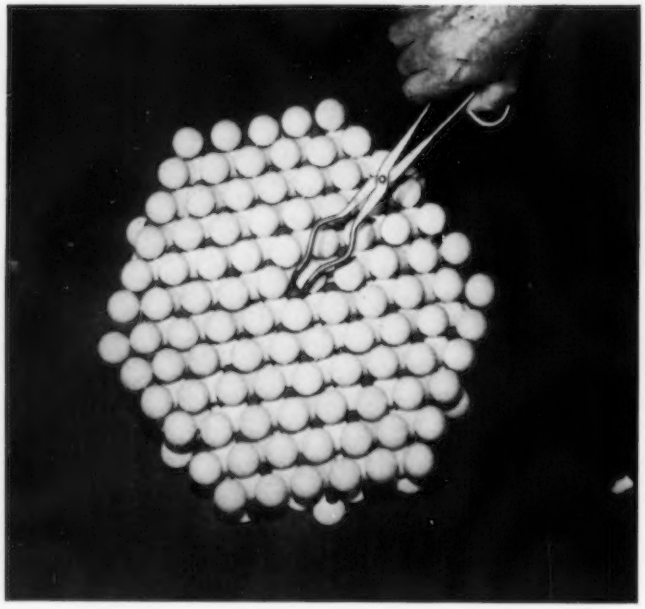
For modern forestry, saws and axes are not enough. Up-to-date equipment, like helicopters and two-way radios, are essential. They help the scientific forester control fire and pests, locate and survey timber, and reseed cut-over areas.

With equipment like this, Weyerhaeuser foresters are constantly improving the productivity of the company's forestlands. By modern forestry practices, and through good forest management, Weyerhaeuser tree farms can produce a continuous flow of wood, assuring a dependable supply of wood pulp and other forest products.

WEYERHAEUSER PULP DIVISION

PAPER CLAYS . . .

to benefit the future of your company



PROBE STARTS

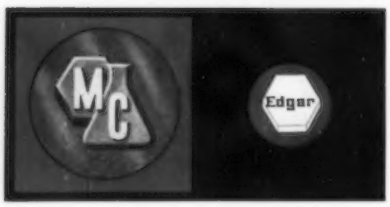
with fundamentals—the molecular structure of kaolin. To support its role of largest U.S. producer of water-washed clays, and pioneer in this development, M & C research and quality control facilities and data are second to none—cover every step from clay mines to finished papers and paperboard.

NO ROOM FOR VARIABLES

This X-ray diffraction equipment—used to determine crystalline composition of substances—helps M & C put the stamp of *unexcelled uniformity* and *consistent quality* on our paper clays . . . attributes you can use to set new standards in production, quality and printing behavior. Dr. C. G. Albert, M & C's Director of Application Research, examines X-ray test results.

"CRITICAL"..."RIGID"...

are words all papermakers use to describe their viscosity requirements. M & C's newest tool for measuring this vital property—the inclined plane viscometer—helps set new standards of controlled viscosity and uniformity. Glen Hemstock, Senior Chemist, Fundamental Research, (a) positions controlled amount of clay slurry on grid (b) releases impact cylinder (c) measures the resulting smear.



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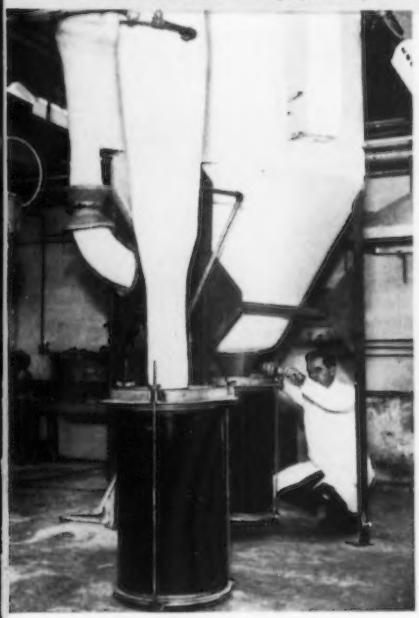
Leaders in creative use of

Exciting focus on scientific creativeness

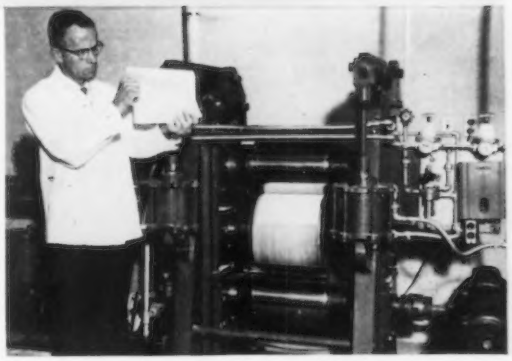
At its big, modern Research Center, Minerals & Chemicals works to create new and improved products that will yield greatest value and lowest costs to papermakers. Our job is to offer more than paper clays; we want them to be so good they become a segment of the future security of your business. Here—in the words and pictures of research—is how M & C *earns* its place as your supplier of today's (and tomorrow's) finest paper clays.

MIN CHEMISTRY *at work*



IMPROVED SHEET GLOSS, BRIGHTNESS AND INK RECEPTIVITY—

as functions of judicious clay selection and use—are uppermost in the mind of Wade Claxton, M & C's Supervisor of Paper Research. Gloss tests run on this lab-scale calender stack help pin down the right answers.

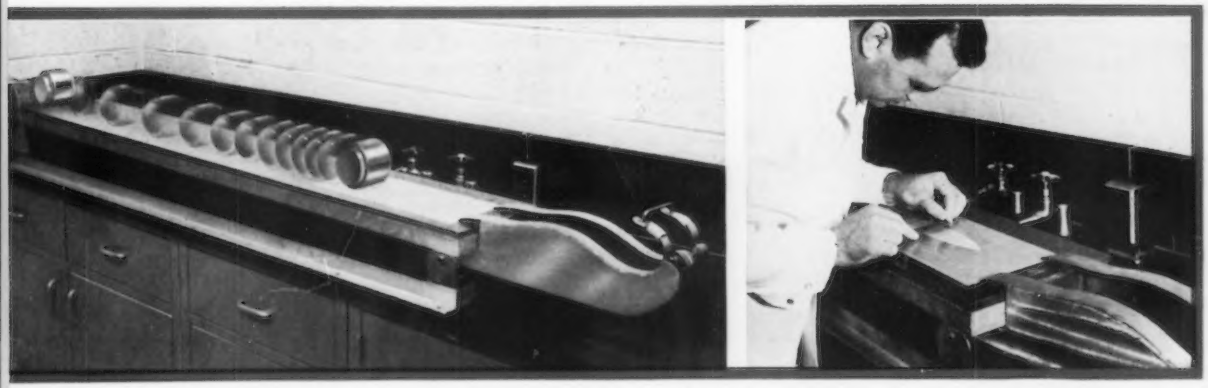


AIR-CONDITIONED CORRELATION

As the closest way to duplicate mill coating conditions, M & C uses this close-tolerance proof press in a constant temperature room. Mike Paval, Paper Chemist, applies test coating on a customer project.

FINEST COATED PAPERS

get their start at pilot level. Using pilot-scale equipment like the Spray Dryer shown here, M & C was first in the spray drying of coating clays. Bill Davis, Pilot Plant Senior Technician, heads for even more remarkable goals under a program that never stops.



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Please send me, without obligation:

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THE NEWEST DEVELOPMENT IN CHEMICAL RECOVERY PRACTICE

The Large Recovery Unit (over 500 Tons)

Just a few years ago, the consensus was that chemical recovery units had reached their maximum size – 350 to 400 tons. Some thought that the numerous problems peculiar to burning black liquor almost automatically put an end to the trend toward larger units.

C-E engineers, well aware of the fact that larger recovery units mean less investment and operating costs per unit of capacity, turned their concerted attention to the problem of size. In quick succession they developed the panel type superheater, the panel type water screen, the decanting furnace hearth and a system of tangential secondary air admission. By combining these developments with a baffleless boiler and modern retractable soot blowers, there evolved a recovery unit design that removed the limitation of size.

Thus, in October, 1954, Combustion received its first order for a recovery unit to handle 1,500,000 pounds of dry solids per 24 hours. Fifteen days later, a different customer ordered a C-E unit to handle 1,610,000 pounds of dry solids. Thirty months later, in March, 1957, C-E received a duplicate order from the first customer and–again 15 days later–received a duplicate order from the second customer. In the interim, five other leading pulp and paper companies ordered large C-E recovery units, the sizes of which are listed below. Largest of these is a unit with a capacity of 2,000,000 pounds of dry solids, by far the biggest recovery unit ever ordered. Today, three of the nine units are in service. In each case, their performance equals or exceeds expectations.

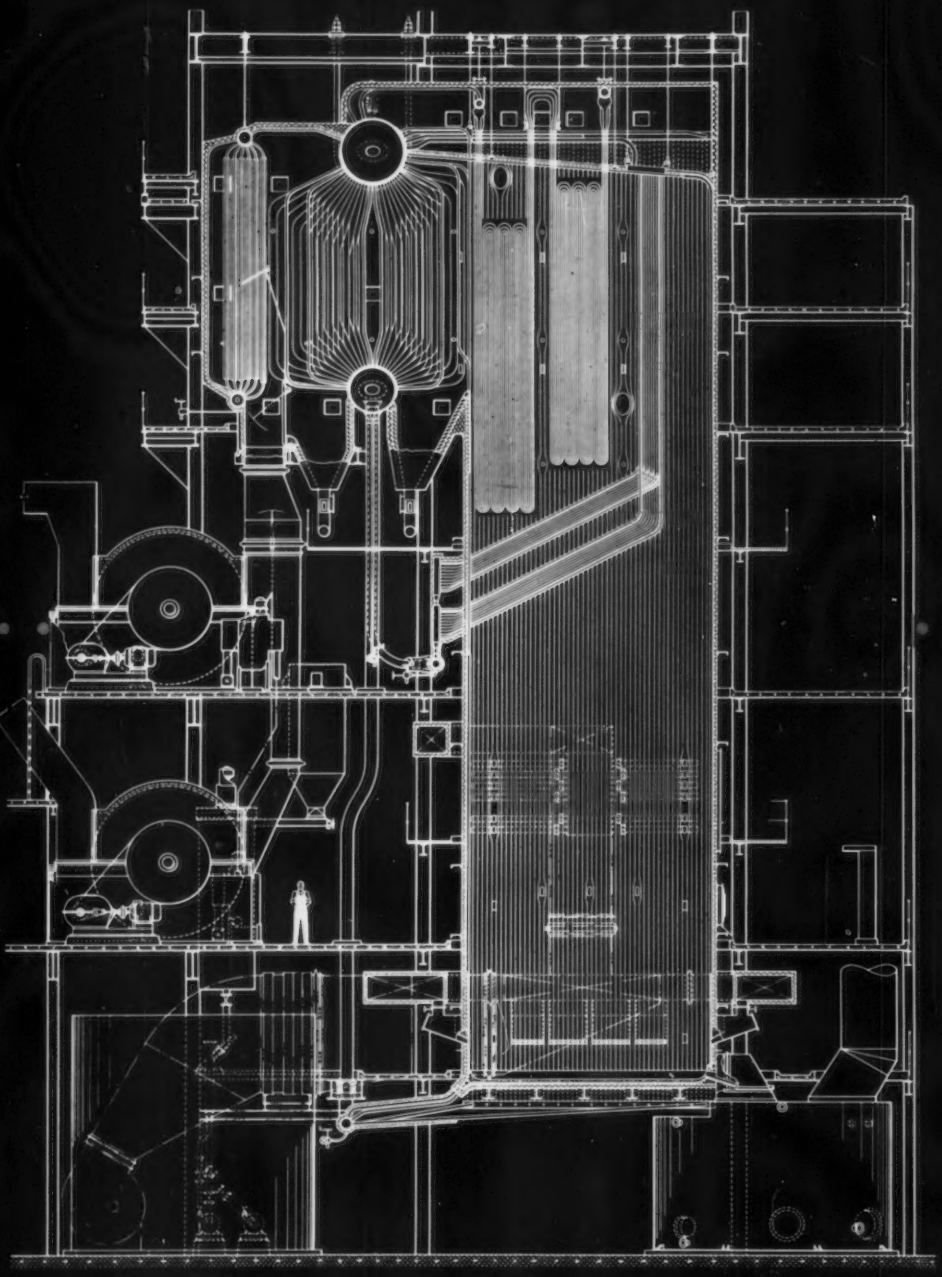
"Breaking the size barrier" represents an achievement made possible by Combustion's continuing efforts to make ever-better products. As to acceptance – the record speaks for itself.

C-109

C-E Contracts for Large Recovery Units
(500 Tons and above)

Name	#Dry Solids/24 Hrs.
Enso Gutzeit OY	1,500,000*
Union Bag & Paper Corp.	1,610,000*
Halifax Paper Co., Inc.	1,500,000*
B. C. Forest Products Ltd.	1,600,000
Longview Fibre Co.	2,000,000
Crossett Paper Mills	1,500,000
International Paper Co.	1,500,000
Enso Gutzeit OY	1,500,000
Union Bag & Paper Co.	1,610,000

*In service



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ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

PULP

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PULP AND PAPER MARKETING-MANAGEMENT

589 FIFTH AVENUE, NEW YORK 17, N. Y.

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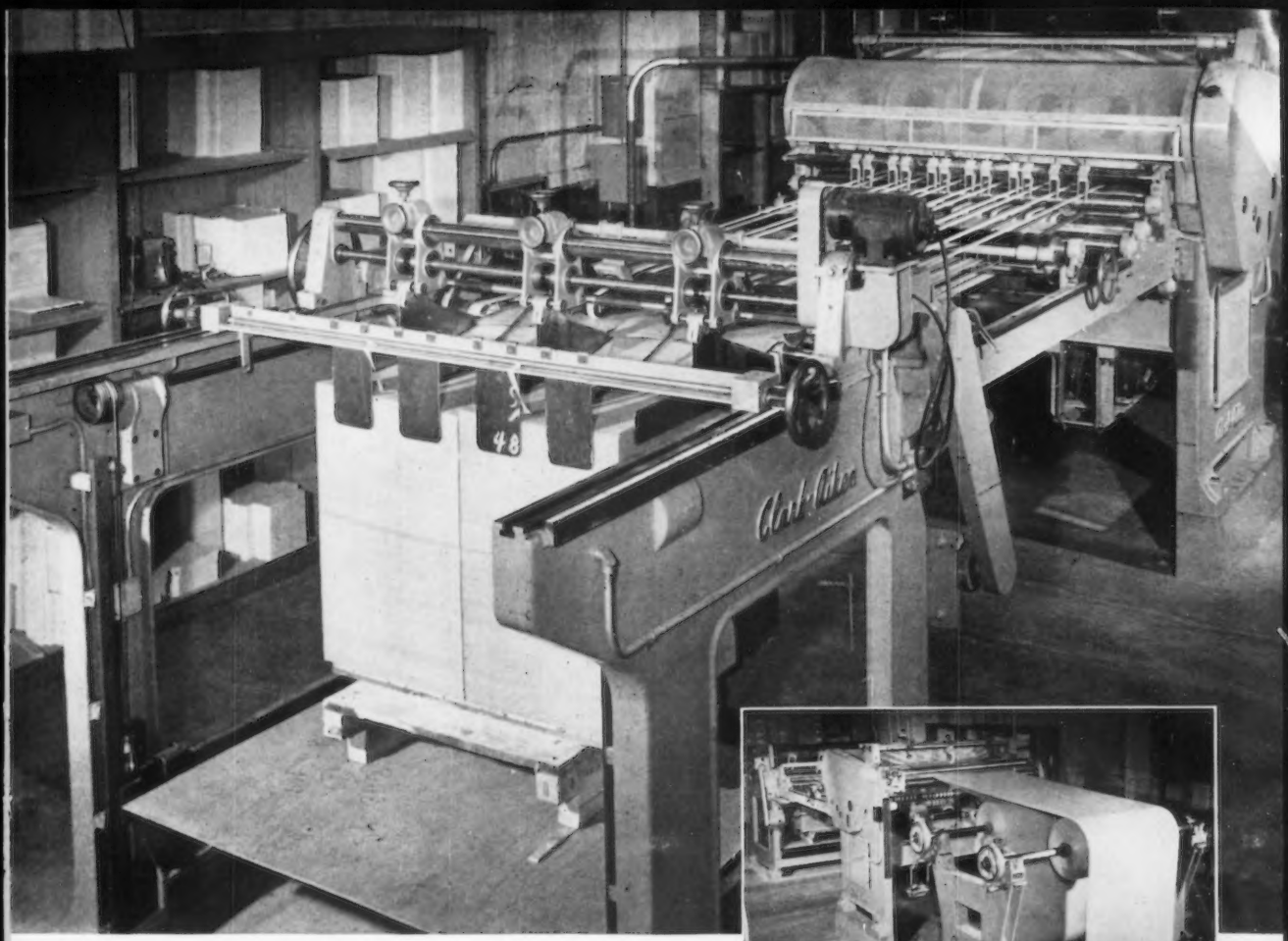
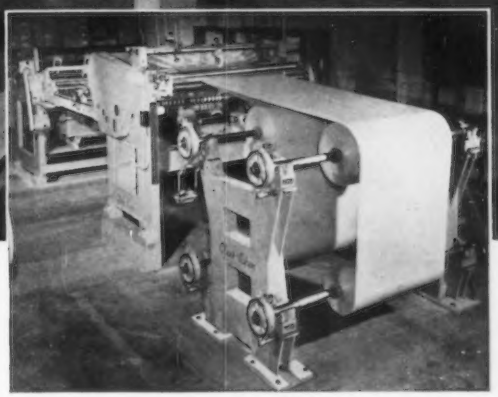
PAPER





After nine months experience sheeting its own stock, Dean C. Mathews, Executive Vice President of Quality Park Envelope Company, St. Paul, Minnesota, reports:

". . . in addition to substantial cost savings, it simplifies procurement and storage problems. We used to buy paper in many sheet sizes; we now buy a few roll widths and are able to order, receive, warehouse and move our paper more easily and efficiently."

"Before . . . we sometimes encountered difficult problems procuring special sheet sizes for special large orders, making it necessary to quote long delivery dates. Now, in most cases, we can take care of these orders from inventory. Trim losses may sometimes be greater than with special size sheets but such losses are more than offset by the saving in price differential and other advantages."

"For stock envelopes, we normally sheet to standard sizes but substantial runs of special sizes are sheeted especially for the job, necessitating frequent change-overs. To make up for this down time, we wanted the highest speed sheeter available. This we found to be the Clark-Aiken machine."

Quality Park sheets various grades of stock ranging from 20 to 52 pound substance at speeds of 500 to 800 feet per minute, drawing from one to four rolls at a time. An additional two-roll backstand is contemplated to permit sheeting of commercial envelope stock from six rolls at a time and the company plans to sheet heavier weights up to 150 pound tag in the near future.

If you produce envelopes . . . or any other product requiring paper, board, film or fabric in sheet form . . . make important cost savings and place yourself in a better competitive position by sheeting your own stock on a Clark-Aiken Cutter-Layboy Unit. Let us know the grades, sizes and approximate quantities you use and our engineers will study your requirements and offer you some interesting figures.

Quality Park Envelope Company simplifies stock procurement storage, handling . . . . . speeds deliveries on "specials" . . . . . CUTS COSTS BY SHEETING OWN STOCK WITH A CLARK-AIKEN CUTTER-LAYBOY UNIT

THE Clark-Aiken COMPANY

956 SPRINGFIELD ROAD

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Crane Stop-Checks Mean Safer Boiler Operation

This valve cost-free for quarter century

Gate, globe, angle or stop-check—Crane steel valves are hard to beat for low-cost service on steam.

This is proved again on the installation at Scott Paper Company's West Coast Division at Everett, Wash. This Crane 300-pound stop-check has been on one of its boilers since the pulp mill was built in 1929. Working pressure: 250 psi at 450 deg. F.

Not until 1954 did this Crane No. 30XU valve need any repairs—after 25 years of steady operation with just routine maintenance. Now with new parts, it's ready to set another such record.

A single moving part: the disc—with chatter-free throttling lip—and effective disc cushioning—is one of the many reasons why Crane stop-checks have racked up this kind of service record in installation after installation. Ask your Crane Representative for full details, or write to address below.

IDEAS FOR YOU in this free book of "Valve Performance Facts." Your Crane Man has a copy for you.

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PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Pulp Price Pattern Showing

As we go to press the pulp price pattern for the fourth quarter is beginning to take shape. Briefly it looks like this—Bleached kraft and bleached sulphite and soda are up. No change in Southern and Pacific unbleached kraft. A $5 rise for northern unbleached kraft. Unbleached sulphite, uncertain. Semi-bleached kraft, no change. Bleached kraft seems to be establishing a new pattern as follows: Southern and Pacific $157. Northern standard grades $160 and premium grades $162.50. A new factor in the Scandinavian pulp situation is Stora Kopparberg's announcement that all its pulp will now be sold on a fully delivered price. Action of other Scandinavian producers was unannounced at press time.

August Industrial Production Picture

Industrial production in August held at the June—July level, according to the Federal Reserve Board. Private housing starts began to move upward. Automobiles were up but aircraft and TV sets and household grades were down. Also up were steel, rubber, building materials, chemicals and petroleum refining. Mining output was little changed while textile and clothing manufacture appear to be off slightly. As previously reported paperboard was up in August and paper off slightly.

Newsprint Production Leveling Off

Recent newspaper reports of the newsprint production situation (as usual) are misleading. Both Canadian and U.S. newsprint mills are operating at something less than full capacity rate, but this does not necessarily represent an actual decline in tonnage produced, rather reflects the effect of increased productive capacity combined with a leveling off in demand by the newspapers. Actual tonnage figures for August show Canadian production was off a very small amount while U.S. production was up fractionally.

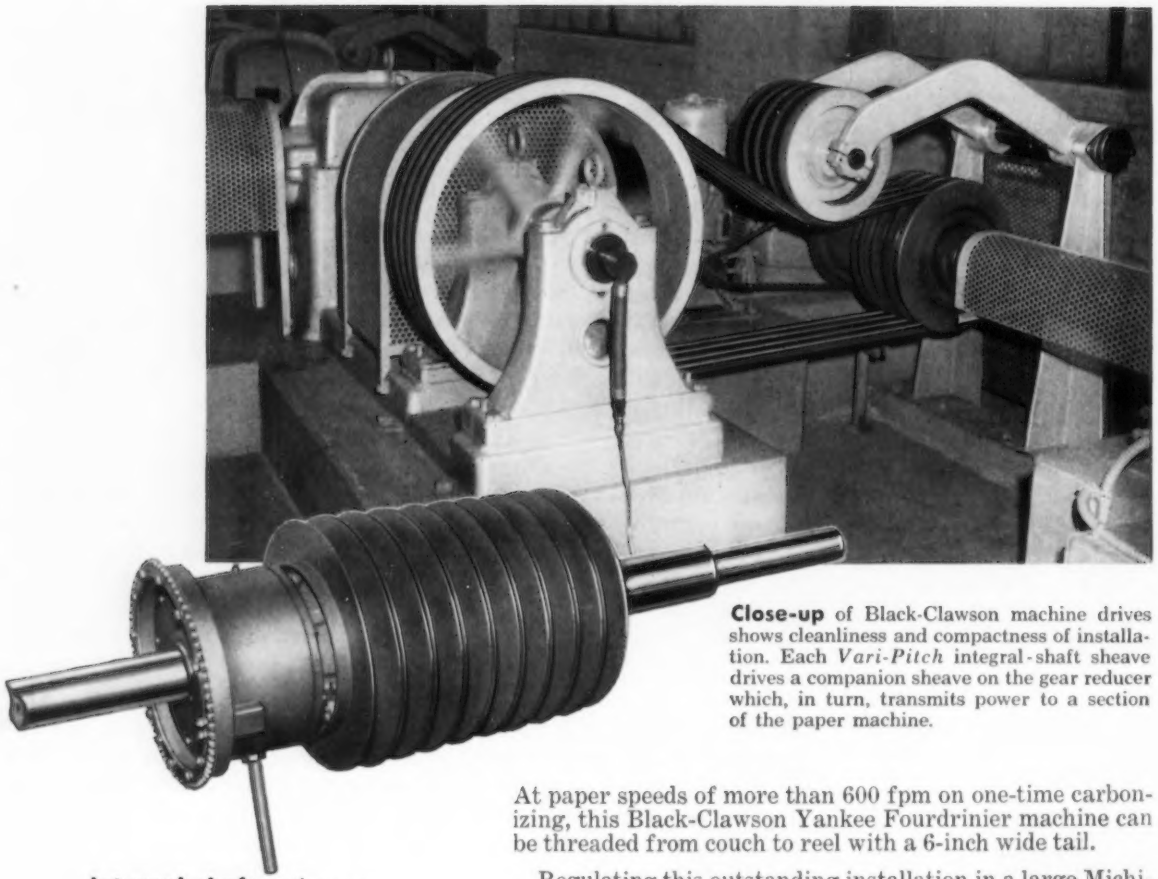
Production 3.6% Under Jan.—July 1956

Preliminary estimates made by the A.P.P.A. show that paper and board production for the first seven months of this year was 17,787,000 tons, a decrease of 3.6% below the first seven months of last year. Total paper production was 8,079,000 tons, a decrease of 1.5% and board production was 8,217,000 tons, a decrease of 4.0%. Of the paper grades, only tissue and newsprint showed increases, 3.7% and 17.0% respectively. Of the board grades, paperboard declined 3.8% while building board was off 12.1%.

1st Half Sales Up, Profits Down

Results of the latest A.P.P.A. survey of 73 companies show sales up 8% and profits after taxes down 11.6% in the first half of 1957 when compared with the like period of 1956. Sales of the 73 reporting companies (covering approximately 40% of the industry) amounted to $2,171 million from January through June of 1957 as compared with $2,014 million in the same 6 months of 1956. Profits after taxes were down to 7.8% of net sales for the first half of this year. For the same period of 1956, profits after taxes were 8.9% of net sales. These figures support earlier statements in this column. A news story in this issue reports on the falling profits of newsprint producers.

Texrope Drives regulate 600-fpm threading of Black-Clawson machine in Michigan mill



Close-up of Black-Clawson machine drives shows cleanliness and compactness of installation. Each *Vari-Pitch* integral-shaft sheave drives a companion sheave on the gear reducer which, in turn, transmits power to a section of the paper machine.

Integral-shaft motion control *Vari-Pitch* sheaves used as sectionalized paper machine drives are made exclusively by Allis-Chalmers. Their use results in lower operating costs, more accurate speed control, more continuous production... MORE profit for users.

At paper speeds of more than 600 fpm on one-time carbonizing, this Black-Clawson Yankee Fourdrinier machine can be threaded from couch to reel with a 6-inch wide tail.

Regulating this outstanding installation in a large Michigan mill are integral-shaft motion control *Vari-Pitch* drives. Their application results in speed control within 0.1% and permits the ultimate in simplicity of operation.

As replacements or as new machinery components, specify *Texrope* drives everywhere in the mill. Contact your A-C sales office or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-5387

Industry Sales Up, Profits Down

Results of the just completed American Paper and Pulp Assn. survey of 73 companies show sales up eight per cent and profits after taxes down 11.6 per cent in the first half of 1957 when compared with the like period of 1956. Sales of the 73 reporting companies amounted to $2,171,000,000 from January through June of 1957 as compared with $2,014,000,000 in the same 6 months of 1956.

Reports received by the association show profits after taxes were down to 7.8 per cent of net sales for the first half of this year because of the higher costs of labor, transportation and materials. For the same period of 1956, profits after taxes were 8.9 per cent of net sales.

According to Robert E. O'Connor, acting executive secretary: "It is expected that net profits for the whole year may be less than 1956. However, due to the anticipated higher rate of production for the balance of the year, the difference may not be as great as indicated by the 11.6 per cent first-half figure."

Production of paper and paperboard was 15.5 million tons for the first six months of 1957, about three per cent below the same period a year ago. This was still the second highest total of any first half in the industry's recorded history. Continuation of this rate would result in a total for the year 1957 approximately the same as the 31.4 million tons record production of last year.

Editor's Note: The sales and profits data above confirms earlier estimates on our Trends page.

Union Bag-Camp Furthers Expansion

Union Bag-Camp Paper Corp. has recently taken a major step toward completion of its current expansion program now underway at the Savannah, Ga. paper and pulp mill. The company has placed an order for 24 Black-Clawson jordans.

The jordans will augment existing refining equipment and also prepare stock for the new number seven paper machine. When the new equipment goes into production late in 1959, it will add 400 tons of kraft paper and board per day to the output of the mill. The new production will be mainly in board and grades for market and conversion.

New Brunswick Scholarship Awarded

The scholarship committee of the University of New Brunswick has selected Allan Alfred Ritchie, Edmundston, N. B., as recipient this year of the Harold Crabtree Memorial Scholarship valued at $1000.

This scholarship was established by Fraser Companies, Ltd. at the University of New Brunswick in memory of the late Harold Crabtree, C.B.E., who was chairman of the company's board of directors from 1933 until his death in February 1956. The first of these scholarships was awarded last year and one will be granted each year over a ten year period.

Office Workers' Strike Averted

A strike of office workers at Consolidated Water Power & Paper Co. offices at Wisconsin Rapids, Biron, Stevens Point and Whiting, all in Wisconsin, was averted this month by a settlement reached at a last ditch meeting.

The settlement included a five per cent general wage increase, a 39-hour week instead of a 40-hour week, and three weeks vacation after 12 years instead of after 15 years. The five per cent increase is retroactive to May 1.

Terms of the agreement were made public by officials of the firm and International Office Workers' Local 95, which represents about 195 employees.

Oxford Acquire Subsidiary's Assets

Oxford Paper Co. will acquire the assets and assume the liabilities of its wholly-owned subisidary, Oxford Miami Paper Co., West Carrollton, Ohio, on September 30. Oxford Miami henceforth will be operated as a division. The change in status will not affect either operations or personnel. The move, according to William H. Chrisholm, Oxford Paper Co. president, is being made in the interest of simplifying the overall corporate structure.

Canadian Fine Papers Decrease Slightly

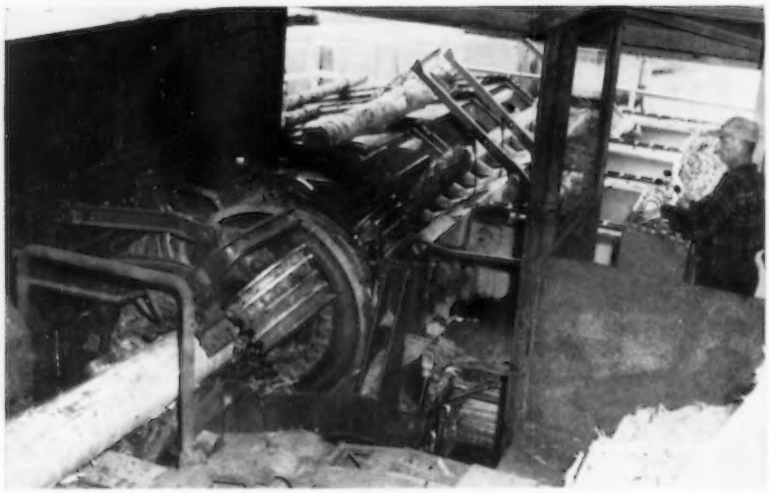
Canadian fine paper production and shipments were off slightly in July but continued ahead of last year's total for the first seven months, according to the Canadian Pulp & Paper Assn.

July output was 20,306 tons, a decrease of less than one per cent from the 20,449 tons produced in July last year. Shipments during the month were off 5.8 per cent and totalled 18,702 tons as against 19,859 tons shipped in July last year.

Fine paper production to the end of July was 152,557 tons this year as against 144,619 tons in 1956 while shipments for the same seven month period totalled 151,015 tons this year as compared with 145,273 tons last year.

Exports of fine paper were 969 tons in July this year and 1,213 tons in 1956. For the first seven months exports totalled 8,944 tons as against 9,336 tons last year.

Some 2,443 tons of coated paper were processed in July as compared with 2,316 tons in the same month last year. Shipment for the month were 2,443 tons this year and 2,281 tons in 1956. Coated paper processed in the first seven months totalled 17,667 tons as against 17,225 tons last year while shipments for the same seven month period were 17,639 tons this year and 17,085 tons in 1956.



NEWLY INSTALLED NICHOLSON BARKER at Crown Zellerbach Corp.'s Port Townsend division handles logs from 4 to 16 in. diameter. The equipment which adjusts automatically is capable of processing about 200 cords of farm wood a day. Logs up to 20 ft. long may be barked on the equipment.

Newsprint Producers' Profits Drop

Earnings reports of 13 out of 14 producers of newsprint in North America who announced them at mid-year show declines averaging 22 per cent from the comparable 1956 figure, according to the Newsprint Information Committee. The trend is believed to be general in the industry and continuing in the third quarter, the committee reported.

The Newsprint Information Committee, composed of a representative group of Canadian newsprint manufacturers, said that in a period when more newsprint was being produced than ever before, earnings decreases ranged from 11.6 to 40.9 per cent.

Following are the percentages of decline in earnings as computed from published reports:

Abitibi Power & Paper Co., Ltd., 17.6 per cent; Consolidated Paper Corp. Ltd., 11.6; Crown Zellerbach Canada, Ltd., 27; Donohue Bros., Ltd., 11.9; Great Lakes Paper Co., Ltd., 29.5; International Paper Co., 21; Powell River Co., Ltd., 25; St. Croix Paper Co., 17.5; St. Lawrence Corp., Ltd., 13.

Coosa River Newsprint Co., 40.9; Crown Zellerbach Corp., 24.8; Great Northern Paper Co., 29.6; Minnesota & Ontario Paper Co., 27.5.

The lone company to report a profit increase—14 per cent—is the Bowater Paper Corp., Ltd., whose world-wide operations are conducted from London. The company and its subsidiaries manufacture a wide range of products in addition to newsprint.

Thomson Paper Suggestion Awards

Thomson Paper Mills recently awarded $210 to winners in the company's suggestion plan system at the annual picnic. The largest amount awarded under the suggestion system, $100, went to Willard Lavey. Others in their order follow: second, $50, William Butz; third, $25, Albert Charron and James Periard; fourth, $15, Leo Hughes; fifth, $10, Joseph Kelly and Philip De Foe; two prizes of $5, Dorothy Thibodeau.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending September 7, 1957, was 73.2 per cent compared with 89.2 per cent revised for the preceding week The ratio was 76.8 per cent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paper board production ratio for the week ending September 7, 1957, was 72 per cent, compared with 95 per cent for the preceding week and 71 per cent for the corresponding week last year. The sharp decline in the operating ratio is due to the Labor Day Holiday.

(Detailed statistics on page 62.)

South Toledo Oregon—Not Ohio

Dear Sir:

It was something of a surprise to learn from your issue of September 2 (Page 17) that we had moved the new kraft mill halfway across the country to South Toledo, Ohio.

Freight rates being what they are, maybe we should consider that location—except that the wood is all out here!

Cordially yours,
H. S. Daniels
President
Georgia-Pacific Paper Co.
Portland, Oregon

Editor's Note: Our embarrassment at this error is eased by Mr. Daniels' good humor.

Paper Scholars At Miami U.

Six Miami University freshmen have been named as first recipients of the $500, job-related Miami University Pulp and Paper Technology Scholarships provided by Ohio's pulp and paper industry to boost Miami's new course offering in that field.

They are David J. Metzler, Hamilton; Richard L. Malott, Hamilton; William R. Peacher, Hamilton; Tom B. Clevenger, Marysville; Charles I. Eakins, Chillicothe, and E. Eric Osborn, Coshocton. All are freshmen.

The scholarship winners are among those in the first class in the four-year paper techniques and chemistry course which Miami is introducing this year in cooperation with the industry. First such course to be offered by an Ohio school, it was requested by industry representatives. Some of the 13 freshmen pre-registered for the course have been recruited by the industry, and an industry recruitment committee plans to discuss opportunities in the field with other freshmen during Miami's registration week.

Each scholarship recipient gets $500 toward his expenses for the freshman year at Miami plus assurance of a job next summer with one of the 20 firms which have shared in planning the project and financing the scholarships. Each scholarship is understood to be good for four years, although full details are still being worked out by an industry scholarship committee. The committee also has indicated plans to offer new four-year job-related scholarships to future freshmen.

Col. Cellulose Moves

The Vancouver offices of Columbia Cellulose Co. Ltd., Celgar Ltd., and Canadian Chemical Co. Ltd. have been moved to 1030 W. Georgia St., Vancouver 5, B. C.

THE BIRD SAVE-ALL PUTS PAPER DOLLARS RIGHT BACK IN YOUR POCKET

What with today's high cost of raw materials and of processing, letting stock go down the drain just before it gets made into paper becomes an intolerable extravagance.

A Bird Save-All system returns all the fibre and filler to the machine chest and does it at lowest cost per ton.

Estimates of the net savings can be worked out for you in advance. Let us show you how quickly the Bird Save-All pays for itself.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

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Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

The DRAPER Felt
DRAPER BROTHERS COMPANY
CANTON, MASS.

PAPER PEOPLE

William R. Maull

Paul E. Phillips

Philip C. Evanoff

Changes in Mead Sales Service

On October 1, William R. Maull retires as director of Sales Service for Mead Corp., Chillicothe, Ohio. Paul E. Phillips, assistant director of Sales Service, will be promoted to the directorship. At the same time, Philip C. Evanoff, Sales Service representative, will be promoted to the newly established position of associate director of Sales Service.

Mr. Phillips and Mr. Evanoff will be charged with the operation of the department which services Mead customers for white papers. Both have worked their way up through the ranks to their new responsibilities. Mr. Phillips has 29 years of service with Mead, and Mr. Evanoff has 25 years.

Fibreboard Promotes Burke

Norman T. Burke has been appointed to the position of manager, frozen food packaging sales of Fibreboard Paper Products Corp., San Francisco. He formerly held the position of San Francisco district sales manager. His office will be at Fibreboard's Brannan St. headquarters.

Price Chosen Mugler President

Lavern A. Price has been elected president of Charles P. Mugler & Co. Inc., wholesale paper and twine company in Buffalo, N. Y. He succeeds the late Charles P. Mugler. Mr. Mugler's son, C. Philip Mugler, has been elected executive vice president.

Elected Trustees Of Chemistry Institute

W. R. Adams, president of St. Regis Paper Co., and P. H. Glatfelter, III, president of P. H. Glatfelter Co., were elected members of the board of trustees of the Institute of Paper Chemistry by the supporting members of the Institute at their 28th annual meeting held in Appleton, Wis.

The new trustees, who will serve for a five-year term expiring in 1962, succeed Stuart E. Kay, vice president of International Paper Co., and Herbert T. Randall, vice president of Champion Paper and Fibre Co. Both Mr. Kay and Mr. Randall have served as trustees for many years but were not eligible to succeed themselves under the present by-laws of the Institute.

Karl E. Stansbury, chairman of the board of Thilmany Pulp and Paper Co., was named again as the ex officio member of the board who is nominated by the Board of Trustees of Lawrence College.

Alliance Mills Transfers

G. E. Wilson, vice president of Alliance Paper Mills Ltd., Merritton, Ont., has been transfered to the company's executive offices in Montreal. S. J. Quattrocchi, assistant general manager, has been appointed manager of operations, continuing to make his headquarters in Merritton.

Promotions at Scott's Chester Mill

Scott Paper Co. has announced the following promotions at its Chester, Pa. mill:

Walter H. Herman was named senior project engineer in the staff engineering and development division. Employed in 1953 as an engineering trainee in mechanical development, he was named project engineer in staff engineering the following year.

Gerard F. Dooley was promoted to senior project engineer in the plant engineering department. Employed in 1955 as a project engineer, he is a graduate of the U. S. Naval Academy at Annapolis.

Marian A. Carlson was promoted to employe services supervisor. She was recently staff job analyst. Marguerite L. West was named staff job analyst.

Beau Named Chemist At O-I Mill

Owens-Illino's Glass Co. has promoted Benno J. Beau to chief chemist at the Big Island, Va. paper mill. He has been in the paper industry since 1948, when he joined National Container Corp. as a chemical engineer. He came with Owens-Illinois when National Container was merged into O-I last fall.

Arden C. Dubert

Appointed to W. Va.'s Tyrone Mill

Arden C. Dubert has been appointed technical service representative of the Tyrone, Pa. mill of the West Virginia Pulp and Paper Co. A graduate of Western Michigan College, he will handle technical production problems within the scope of the mill technical service group.

Cornwall Div. Appointments

Howard Smith Paper Mills, Ltd., has appointed W. P. Nesbitt, manager of the Cornwall Division of the company located at Cornwall, Ontario. C. L. Tomlinson, was named an assistant mill manager.

Manager of production until his present promotion, Mr. Nesbitt succeeds H. E. Mason, who is now executive vice president of the company. Mr. Nesbitt has been associated with the pulp and paper industry for the past 27 years. Mr. Tomlinson, formerly general superintendent of Cornwall Mill, has been with Howard Smith for 11 years.

Great Northern Appoints Osborn

Richard V. Osborn has been appointed technical director for Great Northern Paper Co. at Millinocket, Me. He has recently been technical director for Finch, Pruyn & Co. at Glens Falls, N. Y.

Taylor Joins Consolidated

James W. Taylor has joined the engineering department of Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., as a meter and instrumentation engineer. He has been employed by Bailey Meter Co. since 1953 as manager of their Milwaukee district office.

ST. REGIS CO. ENGINEERS met in their second annual engineers coordination meeting in Deferiet, N. Y. Some of the 45 attending were, left to right, J. W. Hartung, New York City; Ado A. Zando, district engineer of St. Regis' northern New York operation and chairman of the meeting; W. R. Haselton, Rhinelander, Wis.; J. H. McCarthy, Jacksonville, Fla.; J. E. Kussman, Watertown, N. Y., resident manager of the company's northern New York mills, and H. V. Hart, Watertown, general manager of the St. Regis northern woodlands.

See what

...pumps handling stock up to 8% bone-dry consistency

Quite a few years ago (in the twenties) you wanted a pump to handle stock up to 5% consistency. We designed one. It did the job to your satisfaction. Since then, your confidence in our equipment has spurred us to match your progressive strides in improving pulp and paper technology. You accepted our succession of new pump developments and improved designs. And heartily endorsed them by putting our pumps in service throughout the mill in more than 50 types of applications.

We think you'll agree that Allis-Chalmers long association with your industry, its intimate knowledge of your pump problems, qualifies us as experts. All this has worked to mutual advantage. And you started it.

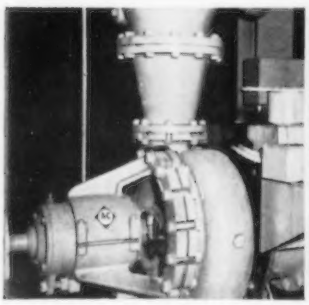
For more than 50 types of pumping applications in pulp and paper mills ... Allis-Chalmers centrifugal pumps

Throughout the mill, wherever a pump is required, Allis-Chalmers offers a specific type for a specific job—*designed* to pump efficiently—*built* for years of dependable service. There are pumps for the process line and for auxiliary services . . . for solids in suspension and for clear liquids . . . pumps to meet any conditions of temperature, corrosion or abrasion . . . pumps to handle any capacity or head requirements encountered in the mill.

Complete pumping unit

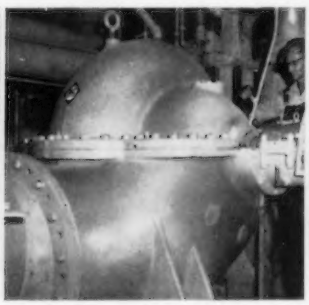
Pump, motor, drive and control—all built by Allis-Chalmers — are available as a unit. This saves you installation time and money — gives you all the benefits of "one source" responsibility.

For pump specifications, call your A-C representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



***ACAP* pump,** single-stage, single-suction—for variable capacity and head requirements. Up to 45,000 gpm, heads to 270 feet.

SSOR pump, single-stage, single-suction—up to 3000 gpm, heads to 225 feet.



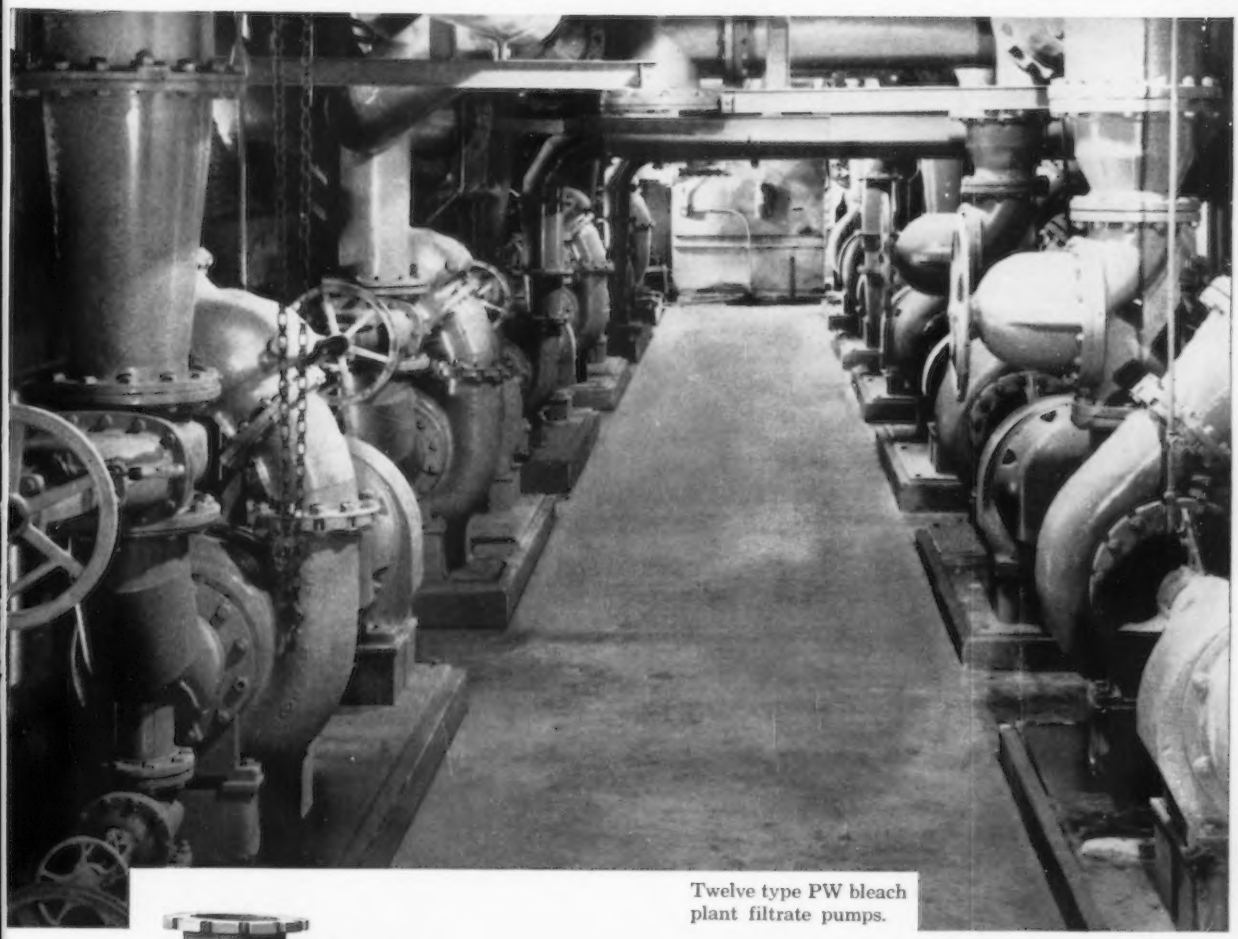
S pump, single-stage, double-suction—up to 260,000 gpm, heads to 600 feet.

PD pump, single-stage, single-suction—up to 1300 gpm, heads to 260 feet.

ACAP and *Hi-Density* are Allis-Chalmers trademarks.

ALLIS-

you started

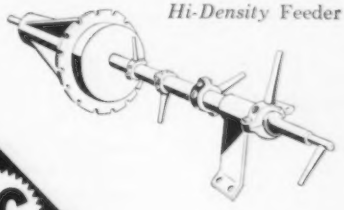


Twelve type PW bleach plant filtrate pumps.

Up to 8% bone-dry consistency

The standard model PW pump will handle paper stock to 3% consistency — adding a suction nozzle permits handling 5% consistency — use of *Hi-Density* feeder enables pumping 8% bone-dry consistency.

Suction Nozzle



Hi-Density Feeder

CHALMERS

A-C ALLIS-CHALMERS

A-5356

NEWS OF CONVERTERS

Staff Changes at Appleton Coated

Arthur J. Roemer has been promoted to plant engineer at Appleton Coated Paper Co., Appleton, Wis.

Hans Hefti, plant engineer since 1937, will stay on beyond his retirement date as research engineer with duties confined exclusively to special projects in the research field.

Mr. Roemer has been with the firm since 1945 and previously was in the engineering department at Marathon Corp. and Alliscon Division of General Motors Corp.

Robert F. Lichtfuss has been named as assistant plant engineer.

New C-Z Sales Reps

Crown Zellerbach Corp. has appointed two sales representatives: William B. Hess for Portland, Ore.; and David R. Turner who will be headquartered in Los Angeles, serving Southern California, Arizona, Southern Nevada, New Mexico and El Paso, Texas.

Nelson Joins St. Croix

N. C. Nelson has joined the sales department of St. Croix Paper Co., 230 Park Ave., New York, N.Y. He was formerly with Brown Co. as division manager of Foreign Sales, and with Bulkley Dunton Co., Inc., wholesale paper jobbers.

Additions To Riegel Staff

Riegel Paper Corp. has appointed Richard A. Warner to the newly created position of industrial relations coordinator, and Robert P. Funke as personnel director of the New York office.

Prior to joining Riegel, Mr. Warner was industrial relations manager for the Paynesville, Ohio plant of the U. S. Rubber Co. Mr. Funke formerly was personnel manager of Allied Purchasing Corp. He replaces James Baer, who has been transferred to the New Jersey Division of Riegel.

O-I Names Symes To Valdosta Mill

John H. Symes has been promoted to assistant superintendent of the Owens-Illinois Glass Co. pulp mill at Valdosta, Ga.

Formerly chief chemist at the Big Island, Va. mill, Mr. Symes is a veteran of 21 years in the paper industry. He was with Mead Corp., Champion Paper & Fibre Co., and other firms before joining National Container Corp. in 1953. National Container was merged into Owens-Illinois last fall.

Hoerner Boxes Building New Des Moines Plant

Hoerner Boxes, Inc. has announced the construction of a new corrugated sheet plant on a 10-acre tract at Douglas and McDonald Aves. in Des Moines, Iowa. Construction began in July of this year and is expected to be completed by December.

The new Hoerner plant will contain 65,750 sq. ft. of floor space and will produce finished shipping containers from corrugated sheets. Modern die cutting, slotting, printing and assembling machinery will be installed to produce the boxes. Both rail cars and trucks will be loaded and unloaded at special docks inside the building.

The new plant will replace Hoerner's present manufacturing facilities at 101 South East 4th St. in Des Moines. Al Blake will be the manager of the new Des Moines plant; Harold McGriff, office manager; and Leonard Lind, superintendent. This plant was the fourth one obtained among the chain of nine box plants now operated by Hoerner Boxes, Inc. It was originally known as the Des Moines Container Co., and was purchased by the Hoerner organization in 1937.

Wm. N. Cromwell

New Sales Manager Of W. Va. Bags

West Virginia Pulp and Paper Co. has employed William N. Cromwell as sales manager of the company's newly formed Grocery Bag Department, Kraft Division.

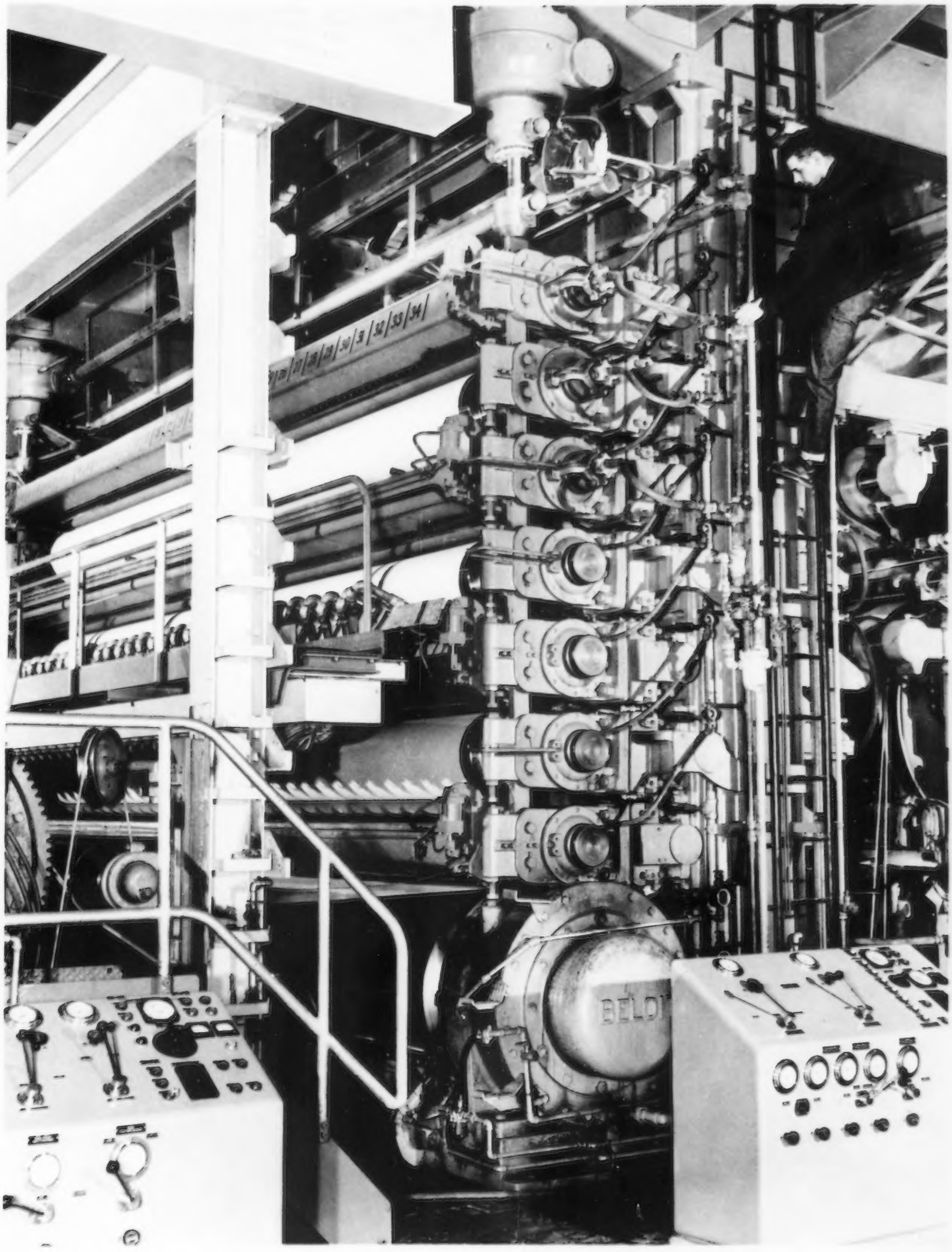
International Plans Florida Plant

International Paper Co.'s container division will build a plant at Auburndale, Fla., for the manufacture of corrugated shipping containers. The company said the plant is expected to be in operation early next year. It will employ 35 to 50 persons.

To Close Box Plant

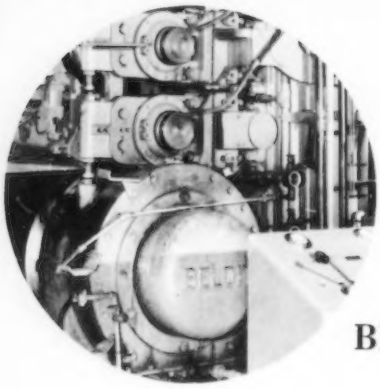
Blaming high production costs, the Gaylord Container Corp. said it will close its Beaver Falls, Pa. corrugated and folding box plant.

S. A. Blackman, Gaylord vice president, said sales personnel from Beaver Falls would be relocated at Gaylord's Pittsburgh offices and the same office would continue to process customer orders.



BOWATERS SOUTHERN PAPER CORPORATION. PHOTO BY J. W. MILLER

Beloit Openside Calender Stack Today's wider, higher speed machines have focused increasing importance on the calender's ability to deliver a sheet of constant caliper and uniform surface finish to the reel. For further details, please turn the page.



BELOIT OPENSIDE CALENDER STACK

. . . uniform nip pressures, sheet threading at high speeds with greater safety

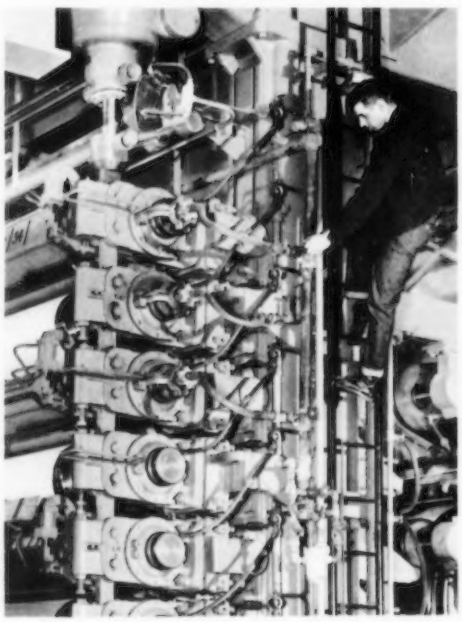
The calender stack has always been an extremely critical piece of equipment. Today's wider, higher speed machines have focused increasing importance on the calender's ability to deliver a sheet of constant caliper and uniform surface finish to the reel. Precision calendering is reflected in the clean lines of Beloit's openside design.

The Beloit openside design permits rolls to separate with a minimum of friction. This freedom of movement eliminates roll "plugging." The self-aligning spherical roller bearings are under continuous lubrication.

Beloit openside calenders employ a positive benchboard-controlled mechanical lift for changing nips or separating rolls. A further engineering advancement is the development of diaphragm air jacks* for maintaining uniform nip pressures throughout the stack for various nip combinations. This arrangement greatly facilitates sheet threading—with greater safety—at high speeds.

*patent pending

Special attention has been given to the design of the calender rolls to permit a more uniform grinding job when it becomes necessary to regrind the rolls. When running, each roll is serviced by a heavy-duty air-loaded doctor.



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WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE

New Metal Edge Box Plant

Modernization and automation combine to make the new plant of the National Metal Edge Box Co. at Barrington, N. J., as efficient as it is attractive. The new $1,500,000 plant provides 114,000 square feet of operating space. The one-story building houses sales and executive offices and manufacturing facilities. The new building provides capacity to triple, when necessary, the output of the plant it vacated in Philadelphia, where it had been since 1887. Approximately 300 employees were transferred to the Barrington plant.

The design of the one-story building provides for the effective flow of material horizontally across the building from raw storage—to printing—to cutting—to finished goods storage. In the receiving and raw storage room, adjustable loading docks handle incoming materials from trucks. There is also a siding for rail delivery. This room, 400 feet long, feeds the raw board to the production lines. Powerful carvers cut bundles of board sheets into the exact sizes desired in production.

Equipment

Stretching almost the entire length of the building are the printing presses and related operations, such as plate and ink storage, color matching, lockup, roller coating. Another long row of machines cut the box flats out of the board sheets which may be printed or plain. Both die and rotary cutting are employed. For customers wanting finished boxes rather than flats, the finished boxes are prepared and packed in the metal staying section. Special labels and handles or clips are also applied. Finished materials enter a storage area after being strapped in bundles, and are then loaded into trucks for shipment.

Conveyors

Among the interesting innovations in the new plant are two conveyor systems for disposal of waste. One is beneath all board cutting operations permitting scrap to move along on the conveyor to a hogger. Here it is blown up through a pipe into a baler adjacent to the loading docks where it is quickly disposed of.

The other disposal conveyor is concealed in the floor under each of the 14 punch presses which make the metal edge stay material. This conveyor carries the metal waste outside the building and deposits it in an open trailer truck.

A third conveyor system is the finished goods conveyor on which completed jobs are placed and automatically steel strapped and spot welded en route to the finished goods storage area.

Operations

Printing, cutting and creasing operations are expedited with the most modern equipment, notably, the new Bobst cutting machines which cut and crease automatically in one operation and at a high rate of speed.

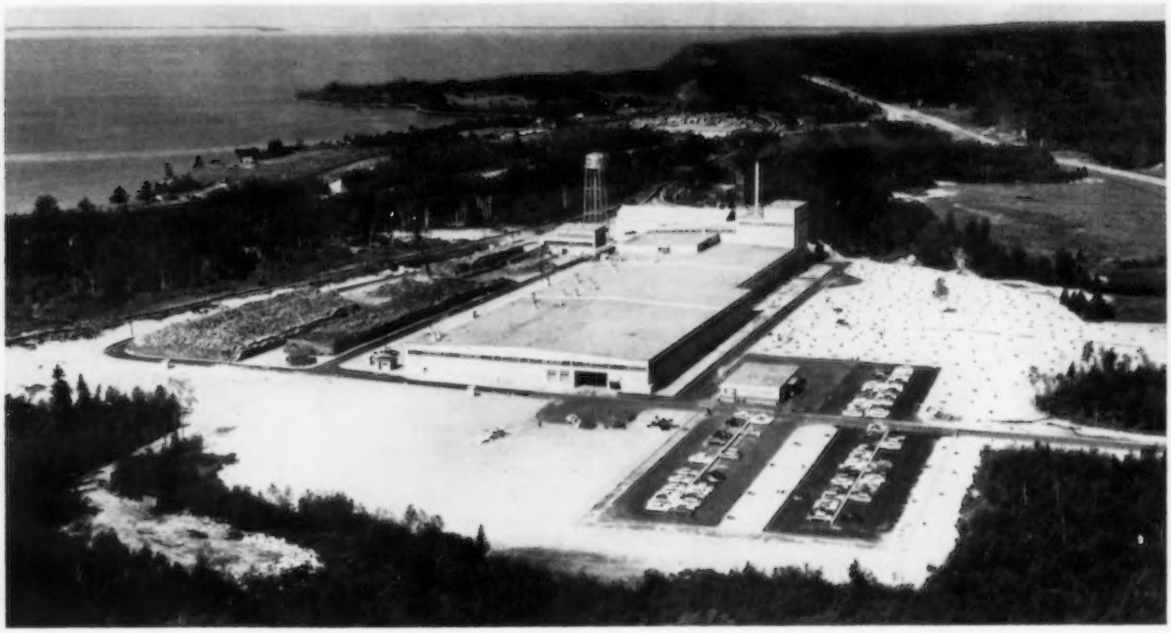
Other major equipment in the plant includes metal punch presses where steel strips are transformed into the corner stay that holds the boxes together and contributes to their strength and durability. Metal Edge stayers, machines used to make up the box by placing the metal edges on the corners, are built in the machine shop.

Employee efficiency and comfort are also improved in the new facilities. All working areas have been equipped with "daylight" lighting which affords equal conditions for judging colors day and night, winter and summer. For added safety, the Celolustre Department—which houses the large machines and ovens used in applying grease, water and acid resisting coatings to board—is equipped with explosive-proof fixtures.

Application

National Metal Edge Box Co. does not regularly sell boxes, though sometimes they do make up and deliver finished boxes ready for use. Primarily, the firm offers to customers box flats of die-cut kraft board, usually printed in one or more colors and scored for folding. The customers also buy Metal Edge machines and stay material. The customer, in his own plant, as he needs boxes from day to day, takes the "flats" and "assembles" the boxes by affixing the Stay to the box corner. According to the manufacturer, boxes so constructed with kraft board are more satisfactory and give better protection than wooden boxes or even metal boxes. The Metal Edge Box Co. was the first to offer a boxboard carton strengthened by steel corners called stays, and in supplying their method to industry, has provided a unique packaging system.

"Sam says there's nothing like bi-carb for a digestive system!"



Canada's Most Modern Insulating Board Plant

J-M's North Bay project uses local hard and softwoods in a brand new mill which is described in detail here.

Paul Van Derveer
Associate Editor
Paper Trade Journal

Insulating board provides a new and important industry in the province of Ontario where Canadian Johns-Manville recently began manufacturing native pulpwoods into a strong, serviceable building board. The company's new plant is one of the most modern insulating board production centers in the country, embodying over 20 years' experience in the operation of similar plants in the United States.

With the decision to expand their operations into the manufacture of insulating board, Canadian Johns-Manville then investigated and evaluated over 30 possible sites before settling on the present location. North Bay proved an excellent site for the new plant, not only because of its central location to markets and the availability of the necessary raw materials such as pulpwood and water, but also because of the availability of good rail and road transportation.

The principal sources of raw materials will be from the Province of Ontario long term timber rights leased to Canadian Johns-Manville and from the purchase of pulpwood from local farmers. By planned cutting and reforestation, the almost 600 square miles on which the company has stumpage rights assures a continuous supply of pulpwood.

Technical details of plant operation and equipment were supplied by Mr. E. T. Hawkins, Project Manager of the North Bay operation. Mr. Hawkins is based at Johns-Manville Engineering Center, Manville, N. J.

Designed to have a capacity of 300,000 square feet per day, the new plant produces completely finished products for home and industry, including decorative panels for ceilings and walls, acoustical ceiling tiles, impregnated sheathing, building board, and roof insulation.

Located on a tract of approximately 150 acres, 1¼ miles northwest of North Bay, the mill provides more than 160,000 square feet of floor space. An unusual feature of its construction is the fact that it was not necessary to drive piles to support the building. The design of the building foundation was governed by the soil conditions at the site, and beneath the layer of sand on which the building stands there is a layer of clay. The building area was pre-loaded by piling sand 20 feet high on the west half and 10 feet high on the east half. These loads were left for three months to consolidate the clay and then were removed.

This pre-loading procedure enabled J-M to take up most of the settlement that would occur under the weight of the building and saved the great expense that piling would have incurred.

J-M had to pour foundations throughout the winter. This concrete work in extremely cold weather necessitated

special care and techniques. Tents heated by blast heaters covered the cement pouring area. By utilizing heated aggregate and maintaining proper temperatures for the first curing, J-M was able to successfully complete the work as scheduled.

In the design of the plant particular attention was given to maintaining continuous production and high standards of working conditions in the extremely cold weather of the North Bay area. The main building is well insulated from the cold through the use of a double wall constructed of J-M Transite and filled with rock wool. An enclosure is provided for the barking drum in order to give the workmen adequate shelter and to keep the wood in a thawed condition during barking. Frozen wood is thawed out in a water-filled tank provided with steam injection to maintain a temperature of approximately 140°F. The soaking tanks are covered by a shed open at both ends to permit escape of water vapor. A traveling cover was also provided so that the tank being steamed could be enclosed to prevent excessive vapor from blinding the overhead bridge crane operator. Another feature is that truck and rail loading areas are within the building. Another concession to adverse weather conditions, which may be a novelty to readers accustomed to a milder climate, is the provision of heater plugs in the parking lot. The heater plugs keep employees car motors warm in the below zero weather.

Preliminary Soaking Aids Barking

Poplar, scotch pine, and jack pine are the species utilized by Canadian Johns-Manville in the manufacture of insulating board. The pulpwood, from 4 to 20 inches in diameter, is brought in either by local farmers' trucks or rail cars in 4-foot lengths. A diesel operated crane with a 50-foot boom is used to unload wood from rail cars directly into the main yard conveyor for immediate use, or into the storage area for future needs. The crane is also used to transport pulpwood from the woodyard to the main yard conveyor. When wood is brought in by truck, it is unloaded manually.

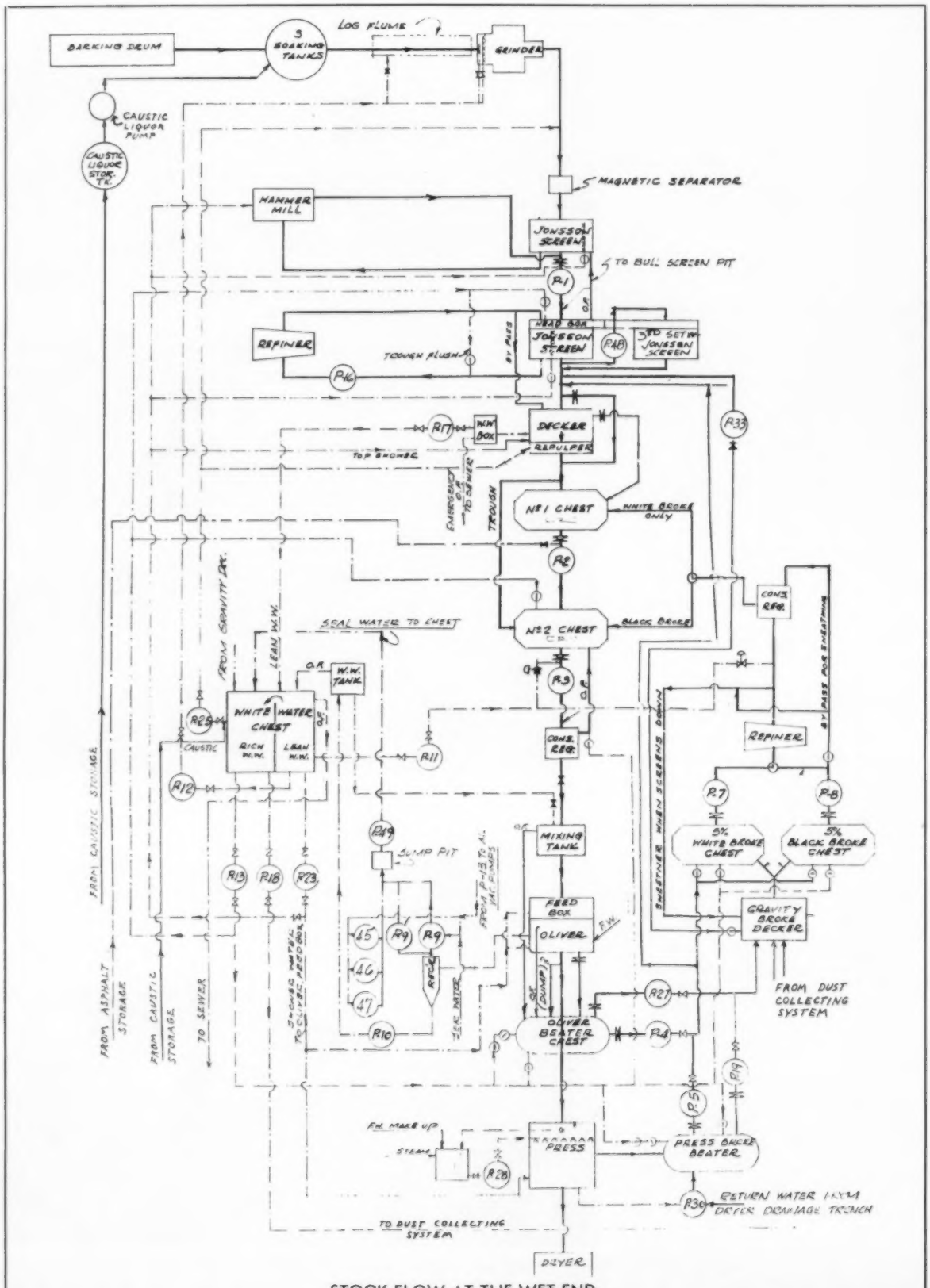
The 250-foot, single strand, main yard conveyor discharges the unbarked wood into a pre-soak tank approximately 100 feet by 20 feet in size. Heated to about 140°F., by the injection of live steam, the pre-soak tank serves to soften or loosen the bark somewhat and to thaw the wood in cold weather.

An 8000-gallon per minute pump circulates water in the tank for uniform heating and directs the wood to the end of the tank where it is removed by

TRUCK DELIVERS LOGS to wood storage yard beside new insulating board plant. Logs are stored in huge piles to await processing.

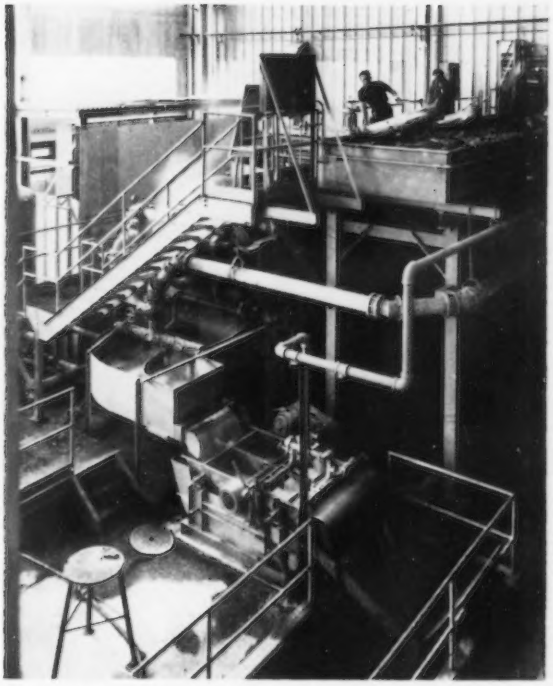
A HUGE GRAB CRANE loads logs onto the main yard conveyor belt.

LOGS ARE REMOVED FROM WOOD STORAGE by means of mechanical conveyor. In this, the first step in the process, the logs are conveyed to a barking drum where the bark is removed.



STOCK FLOW AT THE WET END

OVERHEAD CRANE AND INTERIOR OF SOAKING TANKS. The traveling crane picks logs off the conveyor and dumps them into the soaking tanks.



BARKED PULPWOOD carried by the log flume is fed into the Great Northern type grinder which reduces the wood to pulp.

a three-strand jack ladder conveyor. This conveyor discharges into another conveyor feeding the barking drum. The barking drum, driven at a speed of eight revolutions per minute by a 200 horsepower motor, is housed in a heated building. After barking, the wood is sorted with the poorly barked wood being recycled. Accepted wood from the barker is carried on an inclined conveyor to a horizontal feed conveyor from which the wood is ploughed off into one of three soaking tanks having a capacity of 125 cords each. In the event of extreme difficulty in barking in the winter time, sorting can be done by as many as four men.

Results of the soaking treatment previous to barking indicate that the loosening of the bark is similar to that obtained in a wet drum barking process, but that there is no cushioning effect in the drum as is provided by the water when wet barking.

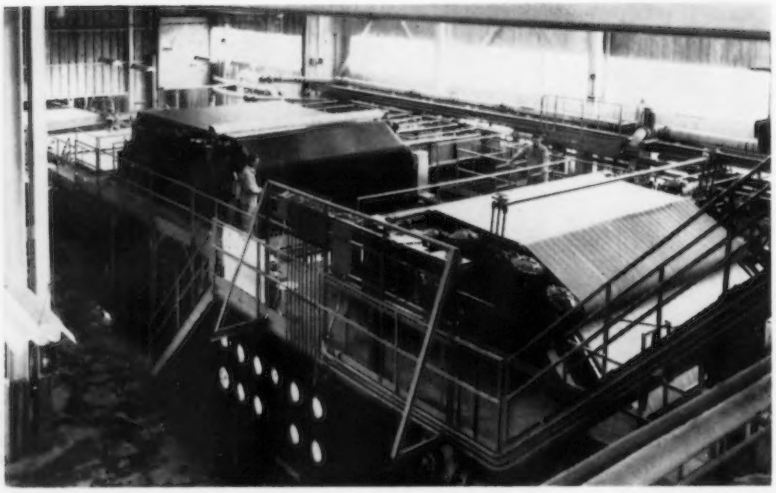
Bark removed from the log is conveyed to a Diamond knife hog which reduces it to small particles. The bark particles are belt conveyed to a bin for storage, from which screw conveyors carry the material to the furnace. Air injected into the furnace, the bark particles are burned in suspension.

Pulp Manufacture

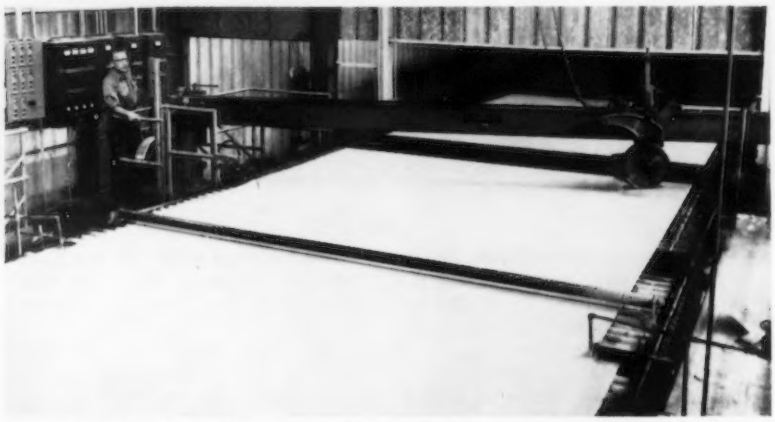
In the soaking tanks the barked wood

PUMP LIST FOR FLOW DIAGRAM

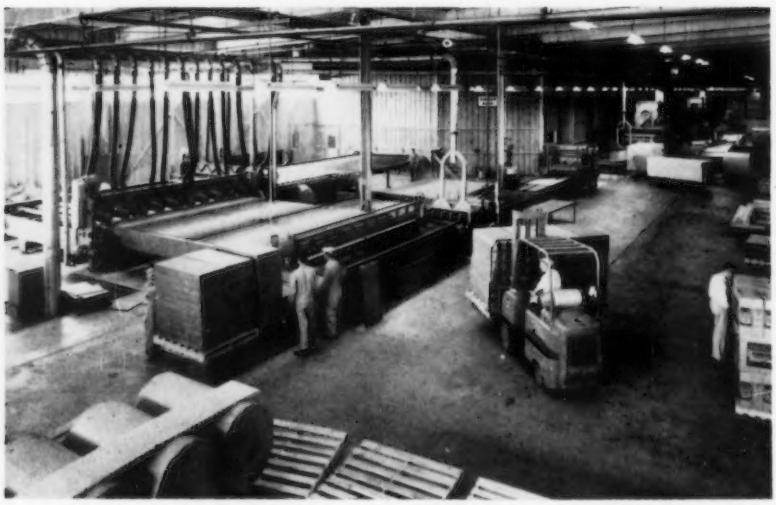
Pump No.	Service & Type	*GPM.	TDH	Pump RPM	Cons.
1	Screen Pump, 8x10 D.S. Can. Pump	1400	50	1150	1.67%
2	No. 1 Chest Stock Pump, 8x10 D.S. Can. Pump	550	28	860	5%
3	No. 2 Chest Stock Pump, 8x10 D.S. Can. Pump	600	53	1150	4.7%
4	Oliver Beater Chest Stock P., 6 EHS Can. I.R.	550	110	1750	5%
5	Press Broke Stock Pump, 6 EHS Can. I.R.	550	110	1750	5%
6/6A	Collector Stock Pump, Eggers 4 EL & 4 RM	400	44/75	1750	0.7%
7	White Broke Stock Pump, 8x4 55OR-N Can. A.C.	150	127	1740	5%
8	Black Broke Stock Pump, 8x4 55OR-N Can. A.C.	150	127	1740	5%
9	Oliver Vacuum Pump, Nash H-10 3,650 CFM	....	....	280	W.W.
10	Oliver Tailings P., 18x16 SL Can. Pump	4300	60	860	W.W.
11	Cons. Reg. W.W. Pump, 5x6 SL Can. Pump	550	110	1750	W.W.
12	Grinders Shower Pump, 6x8 SL Can. Pump	550	137	1750	W.W.
13	Dilution W.W. Pump, 6 CRVL Can. I.R.	1400	50	1150	W.W.
14	Asphalt Trans. Pump, Omit	....	....	....	
15	Asphalt Feed Pump, Duplex Diaph. Size OE Shriver	0.75-3.0 Imp. GPM	36	4-1 Reeves Vari-Drive	
16	Screen to Refiner P., 4 EMS Can. I.R.	100	80	1750	3%
17	Decker W.W. Pump, 10x8 55L-V Can. A.C.	2000	41	1150	W.W.
18	Collector W.W. Pump, 4x55 Can. Pump	800	200	1750	W.W.
19	Press Broke Stock Pump, 4 EHS Can. I.R.	200	110	1750	5%
20	Broke Decker W.W. Pump, Omit	....	....	....	W.W.
21	Size Pump	....	....	....	
22	Starch Pump	....	....	....	
23	Shower Pump, 6x5 SJ Can. A.C.	700	200	1750	W.W.
24	Broke Refiner Pump, Omit	....	....	....	5%
25	Grinder Stock Dilution, 5 CRVL Can. I.R.	800	32	1150	W.W.
26	Grinder Loading Pump	....	....	....	River Water
27	Oliver Beater Chest Stock P., 4 EHS Can. I.R.	200	110	1750	5%
28	Top Wire Shower-Press, 1½ CRVH Can. I.R.	100	230	3450	W.W.
29	Slimicide Pump	....	....	....	
30	Press White Water, 4x3 55LB Can. A.C.	200	15	1150	W.W.
31	Dust Collector Sump Pump	100	15	....	W.W.
32	Dust Collector Sump Pump	100	15	....	W.W.
33	Sweetner Stock Pump, 4 CORVL Can. I. Rand	200	30	1150	1%
40	Caustic Daily Use Pump, K2M-1F Hills-McCanna	0 to 0.5 Imp. GPM	0	56 Strokes P/M	1%
42	Sump Pump Area Drain, 5" Class CMCV Can. Pumps	750	40	1750	W.W.
43	Caustic Storage Pump, 1 CBCS Type D ALCO	15	59	1750	1%
44	Sump Pump Bull Screen AT, Fig. 401-2½ Atlas	50	20	1750	W.W.
45	Oliver Filter Vac.	....	....	....	
46	Press Suct. Rolls	....	....	....	
47	Press Slice Box	....	....	....	
48	Secondary Screen Pump, 10x12 DS Can. Pump	2100	30	860	1%
49	Seal Water Return Pump, Class 3 CMV Sump Pump Can. Pump	300	50	1750	W.W.
50	Dryer Condensate Pump, 1½x2½x10 SM Byron Jackson	55	320	3550	
51	Dryer Condensate Pump, 1½x2½x10 SM Byron Jackson	55	320	3550	
52	Dryer Condensate Pump, 1½x2½x10 SM Byron Jackson	55	320	3500	
53	Dryer Condensate Pump, 1½x2½x10 SM Byron Jackson	25	250	3550	
54	Paint Mix. Sump Pump	100	75	....	
55	Presoak	8000	20	....	



INSULATING BOARD COMING OFF THE FORMING MACHINE. Pulp is formed, pressed and dried to make insulating board.



AUTOMATIC, ELECTRICALLY-OPERATED TRAVELLING SAW cuts continuous sheet of insulating board in required lengths.



TRIMMED BOARD can be delivered by belt conveyor in one direction for palletizing and movement to storage, or in the opposite direction for further finishing operations.

is treated with mild caustic solution heated to 190°F. to 210°F. in order to soften the wood and saponify the resinous material. Live steam is used to heat the liquid which is circulated by means of 1500 gallon per minute pumps. Each soaking tank has sufficient capacity for one day's operation so that while one tank is being unloaded, pulpwood for the following day is being treated in the caustic liquor, and the remaining tank is being loaded.

The softened wood is removed from the soaking tanks with a five-ton overhead bridge crane which deposits the wood onto a four-strand chain conveyor. This conveyor discharges the wood into the grinder feed trough.

The pulpwood is ground in a single Great Northern type grinder equipped with a 3500 horsepower, 257 r.p.m. motor. It will handle logs up to 20 inches in diameter. Close control over the grinding process is maintained by periodic tests for freeness. Space is provided for the addition of another grinder when demand warrants greater production.

After grinding, the stock goes through a primary screening stage which is accomplished by means of a Jonsson type screen equipped with a ½-inch screen plate. Material rejected by this screen is passed through a hammer mill, and returned to process. Secondary screening is accomplished with five Jonsson screens equipped with 3/16-inch plates. Rejects are refined in a 12-inch Fibrefiner and returned to the headbox of the secondary screens.

The screened pulp is thickened by means of a vacuum decker, 8 feet in diameter and 12 feet in length, before discharging into No. 1 stock chest where consistency is approximately five per cent. The stock is then pumped to No. 2 stock chest, where black (asphalt containing) broke may be returned to the process. Stock from this chest is pumped through a consistency regulator, from which it flows to the mixing tank. White water is added here to bring the stock to proper forming consistency before going to the feed box of an Oliver forming machine.

Forming and Drying Operations

The Oliver forming machine was selected in view of the freeness of stock that would have to be handled. The Oliver has been widely and successfully used where ground wood stock is involved and where relatively fast forming speeds are required. Similar Oliver Forming Machines have been operated successfully by Johns-Manville using groundwood at plants in Jarratt, Va., and Natchez, Miss. Although the North Bay plant is designed for running ½-inch board initially at about 22-feet

per minute, it is expected the plant may be expanded to a point where a speed in excess of 40-feet per minute will be required.

Stock is fed into the vat of the machine and formed into a wet mat on the cylinder, which is 14-feet in diameter by 14-feet face width. The vat is equipped with six wobble plate type agitators, driven in pairs by means of three variable speed d.c. motors. Dewatering on the cylinder is aided by pneumatic loaded pressure rolls with a felt between the rolls and the pulp mat. A felt conditioner keeps it clean. A wood doctor plate is used to remove the wet mat from the forming cylinder, from which it is carried by conveying rolls, 3 inches in diameter, to the press section.

The Downingtown press section consists of four pairs of 30-inch diameter rolls. The first top and bottom rolls of the press section are suction rolls, and the top leaving roll is also a suction roll. The rolls are loaded hydraulically, and vacuum for the suction rolls is provided by a Nash L-10 vacuum pump. Vacuum is provided at two suction slices by a Nash K-7 pump.

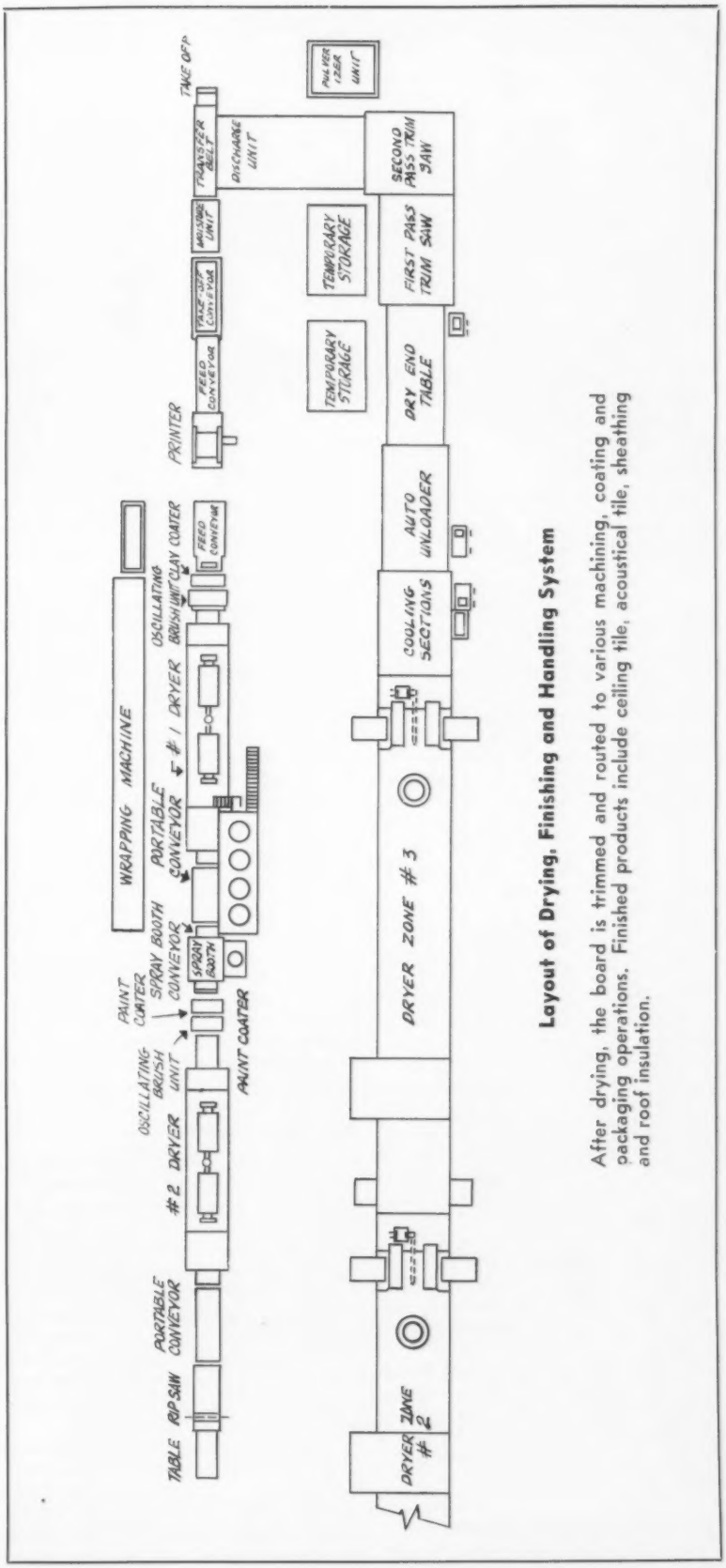
Beater chests at the discharge of both the forming machine and the press section are designed to receive broke at these locations. The broke is reduced in consistency and disintegrated in these chests by means of Liebeck agitators. It is then stored in the appropriate chest, either white broke chest or black broke chest, at approximately five per cent consistency.

After passing through the press section where the heavy press rolls have reduced the moisture content, the wet mat is cut into lengths of approximately 18 feet by means of a Coe cut-off saw. From this point the board is automatically loaded by means of a tipple into one of eight decks of a steam-heated Coe drier.

Operating at a steam pressure of 300 p.s.i., the drier is comprised of three zones and is 293 feet in length. The final zone is automatically controlled in temperature to 360°F. Since there are eight decks, lineal speed in the drier is slightly more than ⅛ of the forming machine speed in order to separate the sheets of board allowing more effective circulation of air. At the discharge of the drier, an unloading section brings the sheets from each of the eight decks to a common elevation to feed into the first arbor of the trim saw.

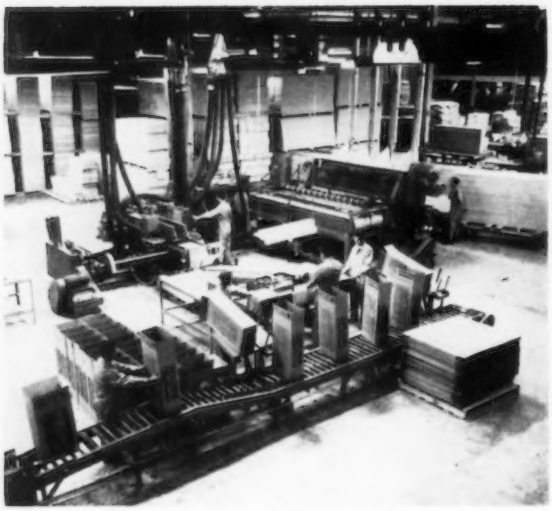
Fabricating Equipment

At the trim saw the dried sheets are cut to various sizes, depending on the product being manufactured. The trim saw will accomodate board 13 feet in width as it passes through the first cutting arbor. The board is then conveyed

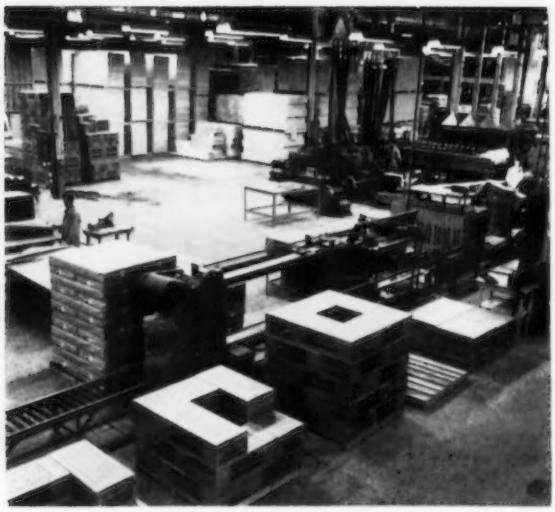


Layout of Drying, Finishing and Handling System

After drying, the board is trimmed and routed to various machining, coating and packaging operations. Finished products include ceiling tile, acoustical tile, sheathing and roof insulation.



CEILING TILES are cut and trimmed to required sizes. The octopus-like tubes collect and remove the dust rising from the cutting and trimming.



A VIEW OF THE FINISHING DEPARTMENT. Finished tile is packaged and stacked on pallets for transfer to the storage area by fork truck.

at a 90° angle to the first pass as it goes through the second arbor. The board, now trimmed for size and length, is transferred to a set of table rolls, which in turn deliver the board to a rubber belt transfer conveyor. This belt conveyor can run in either direction such as to discharge 2-feet by 4-feet roof insulation in one direction or to discharge 4-feet by 8-feet board in the opposite direction. After the board has passed through a set of wetting rolls, it is manually taken off and stored for further fabricating. The purpose of wetting the board is to bring it to equilibrium moisture content with the atmosphere, in this way preventing warpage.

The trimmed board is routed to various machining, coating, and packaging operations in the finishing department. Sheathing can be fed directly to a printing machine from which it is taken off and wrapped. Other products, such as ceiling and acoustical tile, are passed through the coating line, consisting of two coaters and their respective driers. The line is driven by a Dynamatic drive. The coaters utilized are roll coaters, especially adapted to the job. Each coater is followed by three reciprocating brushes from which the board enters propane gas fired driers, 50 feet in length, operating at temperatures up to 700°F.

After the board is coated, it is either taken off directly (4 feet, by 8 feet building board) or passed through a saw directly in line which cuts the board up into planks, or in sizes for further fabricating.

Special Finishing Equipment

Ceiling tile is produced on a Mereen Johnson combination machine consisting of a multiple cut-off saw directly connected to a double edge tenoner. In operation planks consisting of board approximately 13 inches in width by 9 feet in length are loaded in a hopper of the multiple cut-off saw and processed through the equipment such that 12-inch by 12-inch ceiling tile suitable for packaging is taken off at the discharge end.

A complete line of 12-inch by 12-inch acoustical tile is produced by drilling the board in several definite patterns by means of a Zagar multiple spindle drill equipped with 529 drills. Previous to drilling, the beveled edges of the tile are painted on a specially designed machine. The tile is then spray coated for uniform appearance.

A semi-automatic packaging machine is provided for wrapping 4-foot by 8 foot board.

Auxiliary Features

Asphalt and caustic are obtained in tank cars, stored, and metered into the process as needed. Systems are also provided for the preparation of size, alum, and starch which are used in the manufacture of insulating board.

Dust collection for the trim saw and fabricating equipment is provided by means of four Ducon wet collectors. The broke thus obtained is passed over a 4-foot by 12-foot Pascol decker and stored in a broke chest prior to metering into the process at the wet end.

The boiler house, which is adjacent, and part of the manufacturing building houses one 100,000 pound-per-hour Babcock-Wilcox & Goldie-McCulloch boiler equipped with a Detroit travelling grate stoker and provided with suitable bark injection spouts. Fly ash collectors are provided for the removal of any bark fly ash.

The auxiliary boiler consists of a 15,000-pound-per-hour Ames boiler, which is utilized for emergency heating while the plant is shut down.

Process water is obtained by means of a pump station located on the Duchesnay Creek. An interesting feature of the water supply is the fact that it was necessary to build a dam and to dredge the creek bottom so as to maintain a desirable water level and give the new plant a 1,000,000 gallon capacity reservoir. Suitable flow gates in the dam permit drawing directly from the lake in the summer time when the controlled height is at its maximum.

Two pumps provide for fire protection, one 1000 gallon per minute electric pump and the other a 1000 gallon per minute diesel driven pump, are located in the pumping station. A third 1000 gallon per minute pump supplies service water to the mill.

All clean-up water is pumped over a Bird save-all equipped with a 60-mesh screen. Process white water overflow will be kept at a minimum and is provided with a recording flow meter to determine the extent that the system is closed up. Water discharged from the plant is ponded in a settling area giving approximately five days retention time. From this area the water is bled off into Duchesnay Creek.

Design and Engineering

Design and construction of the plant was handled by Johns-Manville's engineering organization in consultation with A. D. Margison and Associates, Ltd., of Toronto, who were engaged as

consulting professional engineers to collaborate in the design and engineering and to pass on the general standards of construction of the plant. Johns-Manville's engineering organization comes under the responsibility of K. W. Hufline, vice president for production.

George S. Smith is director of the engineering organization and A. C. Smith is Johns-Manville's chief plant engineer. E. T. Hawkins was project manager for the new plant and R. N. Harrison, also of Johns-Manville's engineering organization, was resident engineer.

William A. Young is manager of the North Bay Plant.

Canadian Johns-Manville

Canadian Johns-Manville's North Bay insulating board plant is the newest completed project in the company's $65,000,000 expansion and modernization program in Canada.

As a result of this expansion there has been a substantial increase in types and volume of products manufactured in Canada and in exports of asbestos fiber. When the new North Bay plant is in full production Canadian Johns-Manville will produce, from Canadian raw materials, 88 per cent of all Johns-Manville products sold in Canada.

The significance of Canadian Johns-Manville's expansion program is reflected in the company's growth in employment. Since 1945 the number of employees has more than doubled, from less than 2,000 up to about 4,600 today.

The new North Bay insulating board plant represents the fourth entirely new type of industry Canadian Johns-Manville has brought into the Province of Ontario in less than ten years.

Canadian Johns-Manville provided the first new type of industry for Ontario in 1948 when it opened a plant at Port Union, 15 miles east of Toronto for the production of Spintex insulation for the home and industry and Transite (asbestos-cement) pipe. Transite pipe had, for some years, been imported from the United States.

A second new type industry for Ontario was introduced in 1950 when Canadian Johns-Manville opened an asbestos mine and a mill in Munro Township, 12 miles east of Matheson in Northern Ontario. This mill has a capacity of 30,000 tons of asbestos fiber each year and the building is so designed that capacity can be doubled at any time in the future by the installation of additional equipment.

In 1956 the Toronto plant was expanded to bring another new type of industry to Ontario—the manufacture of asbestos Flexboard, Transitile sheets and other asbestos-cement products for the home and industry. Most of these products were formerly imported from the United States. Transitile, for use in the wall construction of industrial plants and many other types of buildings, is a new product added to Canadian Johns-Manville's line of products.

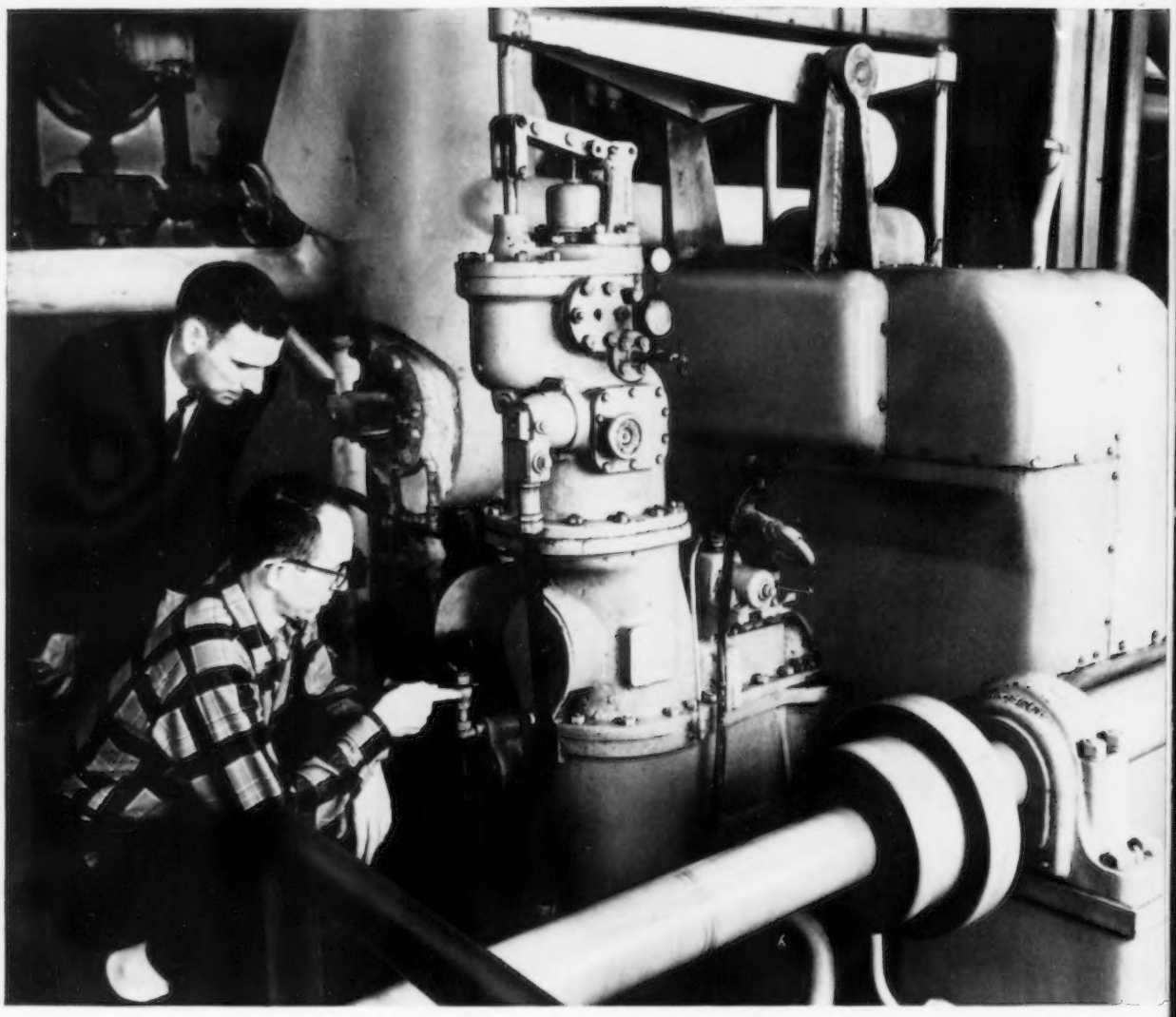
The manufacturing plant at Asbestos, Quebec, adjacent to the company's Jeffrey mine, was the first Canadian Johns-Manville plant to be built in Canada.

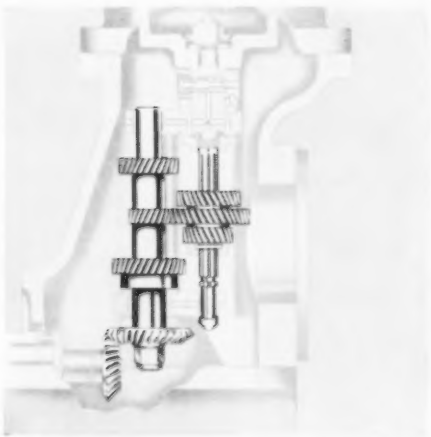
The main product groups manufactured at the asbestos plant are: textiles, packings, cut gaskets, friction materials, insulations, papers, asphalt roofings and saturated felts, asphalt paints and putties, asbestos cement siding and roofing shingles.

At Asbestos, Canadian Johns-Manville operates the Jeffrey mine, the largest asbestos mine in the world producing more than half of the asbestos fiber mined in Canada.

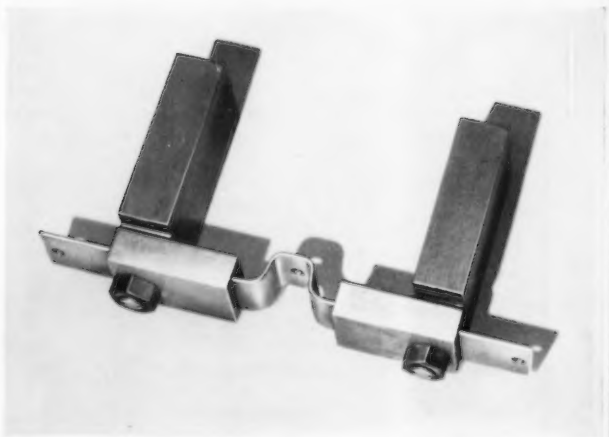
Principal Equipment Suppliers At North Bay

ITEM	TYPE & SIZE	SUPPLIER
Wood Conveyors	Chain	Jervis B. Webb of Canada
Bark Conveyors	Belt	Jervis B. Webb of Canada
Barking Drum	Chain Suspended, Fibre Making Process	Horton Steel Works
Woodyard Crane	Diesel Crawler, 50′ Boom	Dominion Eng. Co.
Bark Hog	Knife Type	Diamond Iron Works
Wood Grapples	Owens Type RC-86	W. J. Knox, Ltd.
Soak Tank Crane	5 Ton Bridge	Provincial Engrg. Co.
Pulp Wood Grinder	Great Northern Waterous	Koehring-Waterous Ltd.
Bull Screen	Jonsson ½″ size	Canadian Ingersoll-Rand
Secondary Screens	Jonsson 3/16″ size	Canadian Ingersoll-Rand
Ground Wood Decker	8′ x 12′ Vacuum	Dorr-Oliver-Long Co.
Broke Decker	4′ x 12′ Gravity	Port Arthur Shipbuilding Co.
Refiners	2—12″ Fibrefiners	Black Clawson
Bull Screen	Reject sizer—20″ x 12″ Hammer Mill	Jeffrey Mfg. Co.
Consistency Regulators	Paddle Type	DeZurik Shower Co.
Forming Machine	14′ x 14′ Oliver	Dorr-Oliver-Long
Press Section	Hydraulic Loaded	Black-Clawson (Canada)
Dryer	8 Deck, 3 Zone	The Coe Mfg. Co.
Trim Saw	18′ Single Arbor	Canada Machinery Corp.
Rip Saw	54″ Single Arbor	Canada Machinery Corp.
Paint Applicators	Black Roll Coaters	Black Bros. Co.
Paint Sprayer	4 Head Automatic	Binks Mfg. Co.
Paint Dryers	50′ Direct Fired Gas	Ross Engineering of Canada
Tile Equipment	Multiple Cut off Saw and Double Edge Tenoner	Mereen Johnson Machine Co.
Acoustical Drill	Multiple Spindle 529 Drills	Zagar
Liebeck Agitators	Beater Chest Agitators	Alexander Fleck Co.
Sheathing Printer	54″ Size	Schmutz Mfg. Co.
Reject Hog	24″ x 30″	Gruendler Crusher and Pulverizer
Dust Collectors	Water Wash	Ducon Co. of Canada, Ltd.
Main Boiler	100,000 lb./Hr.	Babcock-Wilcox & Goldie-McCulloch
Aux. Boiler	15,000 lb/Hr.	Ames Iron Works, Inc.
Mill Motors and Switch Gear		Canadian Westinghouse
Save All (Bird)	60 Mesh Rotary Screen	Canadian Ingersoll-Rand
Equipment Erection		Foundation Co. of Canada





Unique gear shift permits changing ratio of governor speed to turbine speed. Provides top accuracy for each speed range: high, medium and low.



Frictionless speed sensing element reduces governor dead band to an absolute minimum. Design simplicity assures long-term accuracy and maintenance-free operation.

New governor development gives greater accuracy... more uniform paper

Proved by 40-page certified report available to you now

Because of the demand for closer control of paper machine speed, Westinghouse now offers a unique new device... a 3-speed transmission that permits changing the ratio of governor speed to turbine speed. It's a 3 in 1 governor providing high-speed accuracy at lower speeds.

Performance tests were made at St. Marys Kraft Corporation, St. Marys, Georgia, and Canadian International Paper Company, La Tuque, Canada. Oscillograph charts of the operating tests, covering a 10 to 1 speed range, clearly show that the Westinghouse 3-speed governor provides far closer accuracy than paper industry requirements which now state:

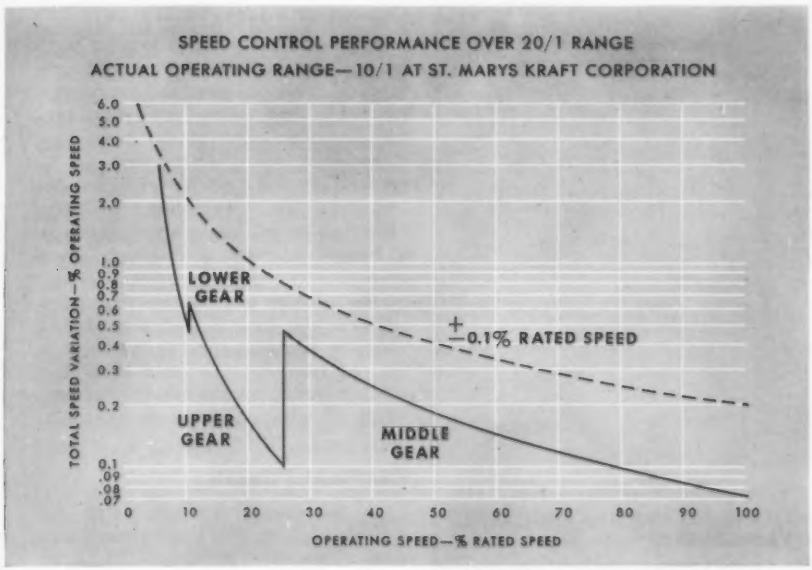
"The turbine speed will not vary from any set speed more than plus or minus 1/10 of 1% of maximum rated speed over a 10 to 1 speed range, provided the combined effect of changes in load, initial steam pressure, superheat, and back pressure do not change the steam flow more than 20% of rated steam flow in 4 seconds."

Write today for your copy of the certified report of operating tests to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-50594-A

New Westinghouse turbine drive operating paper machine at St. Marys Kraft Corporation, St. Marys, Georgia. Pointing to the gear shift governor is W. G. Gray, Jr., assistant plant manager in charge of production, shown with D. H. Barnes, Westinghouse sales engineer.

YOU CAN BE SURE... IF IT'S Westinghouse

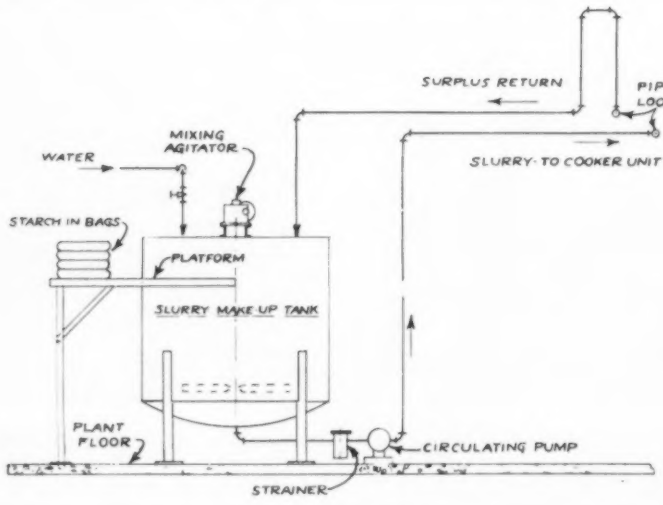


Operating test results of new Westinghouse 3-speed turbine governor on paper machine at St. Marys Kraft Corporation, St. Marys, Georgia. Each gear speed range curve is far below the variation permitted by industry specifications.

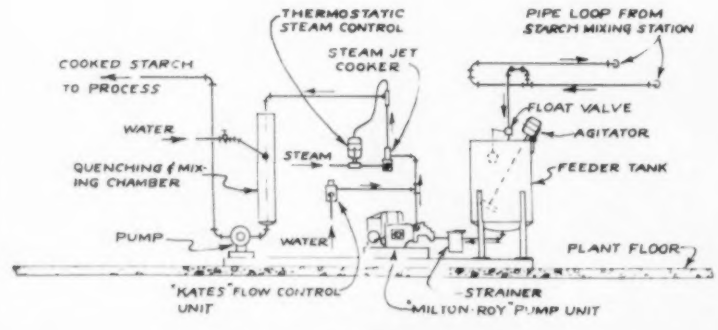
Continuous Starch Cooking Is Effective Means of Preparing Starch for Furnish

Jack E. Chinn

Ass't Machine Room Supt.
Wisconsin Rapids Division
Consolidated Water Power & Paper Co.
Wisconsin Rapids, Wis.



STARCH MIXING STATION



CONTINUOUS STARCH COOKER

Enamel printing papers must withstand ever increasing offset and letterpress speeds without picking or fiber lifting, take multicolored reproductions and endure a high number of foldings. Internal bonding of the coating base stock is very important in the manufacture of these papers as it has a strong relationship to the strength of the finished coated paper. The use of starch, a hydrophilic binder, at the wet end of the paper machine provides a means of enhancing internal bonding of the coating base stock which in turn yields a stronger sheet for the coating operation, and one in which the surface fibers are firmly bound to the body of the sheet.

Cooked or Uncooked Starch?

Starch for this addition may be used in an uncooked, partially cooked or thoroughly cooked form and introduced batches at the stock preparation system or continuously at the paper machine. Selection of a procedure for its preparation and addition requires deliberation. The disadvantage of using uncooked or partially cooked starch as a furnish additive is the high dryer temperatures required near the wet end of the machine to gelatinize the material while the sheet is quite wet. If the starch is not gelatinized little benefit is derived from it other than that of a filler material which has the adverse effect of lowering the paper strength.

Continuous Cooking

In the use of cooked starch for furnish addition, the continuous starch cooker recently developed by Corn

Products Sales Co. has several advantages over older methods and equipment for batch preparation and addition of starch. Batch preparation equipment usually requires a relatively large amount of floor space and capital investment in comparison to the continuous unit; also, because of material hold-up in a batch system it does not lend itself to flexible operation or precise control and creates general housekeeping and spoilage problems. The continuous cooker, incorporating flexible operation and precise control in starch preparation, not only functions as a fine operating tool but also provides a good piece of experimental equipment.

These are some of the factors which led to the decision of Consolidated Water Power & Paper Co. to utilize the Corn Products continuous starch cooking system. This new development makes available a simple, economical means for introducing a uniformly cooked starch at a predetermined rate to the wet end of the paper machine.

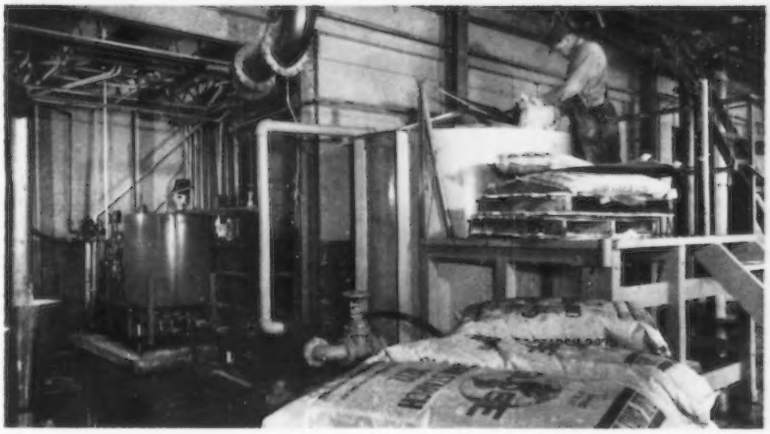
New Continuous Cooker

The Corn Products Sales Co. continuous starch cooker, in service on enamel paper machines at the Wisconsin Rapids Division, provides a continuous supply of starch having the precise properties needed for furnish addition. This unit requires little space and occasions no inconvenience with normal paper machine operation. Its major component is a hydro-heater where the starch slurry is subjected to steam which may be controlled to obtain any desired degree of starch dispersion.

Basic components of the cooking unit include: a positive displacement variable rate pump, a water flow regulator, a temperature regulator and a hydro-heater.

The controllable features of this unit make the addition of starch to the furnish possible under variable but specific conditions of cooking temperature, cooking concentration and addition rate. Thus, it is possible to select the correct starch cooking conditions for each grade of paper manufactured.

Changes in cooking conditions or formulation may be made and realized immediately because a predetermined amount of freshly cooked starch is delivered directly to the furnish in process at the paper machine. Since the unit is geared to prepare only the amount of starch required by the paper machine, a cooked starch storage tank is not necessary. This is most feasible because of the space economy and because it prevents the possibility of continued break down of the starch during storage.



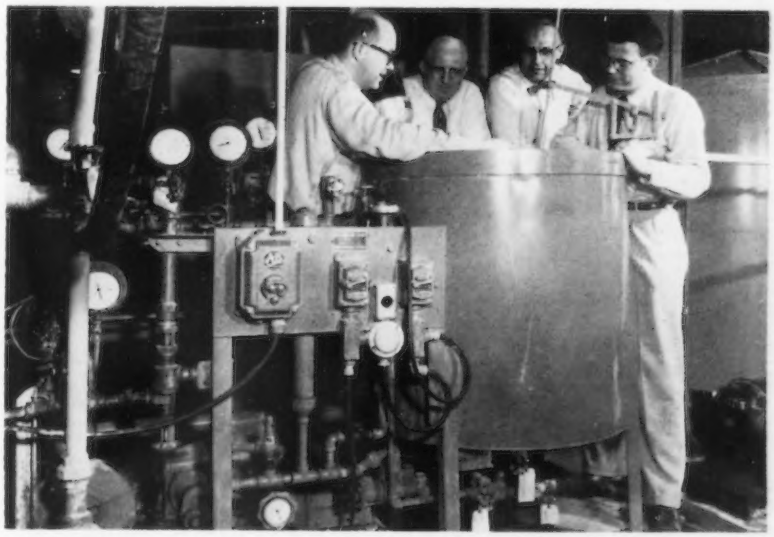
STARCH PREPARATION AREA. At right employee handles packaged starch at mixing station. Corn Products continuous starch cooker is visible at left rear.

How It Works

The chart on page 46 shows essentials of the starch mixing station together with components of the continuout starch system to which the mixing station supplies starch slurry.

The continuous starch cooker serving Consolidated feeds two 75 ton-per-day paper machines on a continuous production basis. A 24-hour supply of starch slurry at four pounds per gallon is prepared in the 1500-gallon slurry make-up tank. A 75 g.p.m. circulating pump keeps the make-up tank contents well agitated and delivers slurry to the feeder tank as required.

From the feeder tank, a positive displacement variable rate pump delivers it to the hydro-heater or jet cooker. Water is added to the fixed concentration slurry prior to entering the hydro-heater via a variable rate flow controller. This water reduces the viscosity of



INSPECTING CONTINUOUS STARCH COOKER are, left to right; Jack Chinn, assistant machine supt.; Mike Mullin, Corn Products Sales; Frank Kaulakus, chief of Coating Development; and George Meade II, production manager.

the cooked starch and facilitates flow through the heater without excessive pressure. The jet cooker efficiently mixes steam with the starch suspension.

Two simple devices control temperature of the starch cook: A steam pressure regulator in the steam supply line and a steam adjustment control on the heater itself, for exact temperature control after establishment of the desired range by the steam pressure regulator.

When cooked, the starch passes to the quenching and mixing chamber where it is quenched with cold water in order to halt further swelling of the starch particles at the desired point before delivery to the paper machine; therefore, a supply of uniformly cooked starch is delivered to the paper machine at all times.

Operation of the continuous starch cooking system requires approximately two man hours per day—one hour for preparation of a day's supply of slurry and one hour for periodic visual inspections, to insure proper operation.

The continuous system has been in operation for a relatively short period, one year, and has not necessitated modification or maintenance.

Benefits from Using Cooked Starch

The use of cooked native cornstarch as a furnish additive, introduced at the fan pump in the proportion of one to five percent of the fiber, has provided the following benefits at a very minimum cost:

1—Increased bursting strength and folding endurance in the base and coated sheets.

2—Improved wax pick resistance.

3—Reduced two-sidedness of the base sheet which contributed to more equal printing characteristics on the wire and felt sides of the coated sheet.

4—Better furnish retention of the wire.

5—Reduced surface fuzz in the coating base stock. This improved bonding of the surface fibers also reduced crumbing and linting in the press and dryer sections of the paper machine.

The benefits of the continuous starch cooking system are realized not only by Consolidated but also by the consumers of Consolidated Enamel Paper, because they do receive a higher and more uniform quality sheet possessing excellent mechanical and printing properties.

NEW LITERATURE

THREE-PHASE GROUND DETECTOR AND ALARM CONTROL PRD-C5700. (Bulletin C57) Contains illustrated sales copy and typical schematic installation diagram. **Principle Research & Development Corp.,** Box 93, Franklin Park, Ill.

WATER CONTROL GATES. (Bulletin 163) Outlines the several basic types of gates and their applications. Also provides information on design characteristics and general construction. **S. Morgan Smith Co.,** York, Pa.

Atlas of Commoner Paper Making Fibres

A permanently bound, beautifully illustrated volume, "An Atlas of the Commoner Paper Making Fibres" by F. D. Armitage, is designed primarily for readers who are employed in the scientific investigation of paper problems, and collects under one cover details on the use of the microscope, identification methods, and the procedures used in photomicrography. In addition, the pictorial "Atlas" presents photomicrographs of many papermaking fibers.

The work is divided into six chapters, the first of which fully describes the microscope and its use. Also included are details on the measurement of microscopic objects. Chapter two covers the examination of papermaking fibers and includes slide preparation, preparation of various staining reagents, and the use of both microscope and stains. Fiber identification and methods of quantitatively estimating the fiber furnish of paper samples are covered in addition to techniques for handling specially treated papers. Chapter three deals with qualitative methods for identifying coating materials, adhesives, gums, and sizes. Reactions of various coating materials with the proper reagents, and confirmatory tests are fully described. Means of identifying specks in paper such as resins, grease, shives, starch, rubber and synthetic materials through the use of the microscope and simple test procedures are also included. These tests are useful in determining the source of the contaminating materials. As a further aid in the study of coated paper and laminated materials, chapter four introduces the reader to methods used for cutting sections of paper for microscopical examination. Methods of producing the section, embedding and mounting are described. For obtaining sections only a few microns in thickness, use of the microtome is discussed.

Chapter five contains an identification key for paper fibers and 37 photomicrographs of the chief fibers used in papermaking. The identification key is an orderly procedure for determining the fiber constituents of an unknown sample. The photomicrographs include plates of cotton, chemical wood, mechanical wood, pine, spruce, aspen, and birch, as well as bagasse, flax, esparto grass, and ramie. Many other fibers are also shown. Under each plate is a brief description of the fiber illustrated, giving typical lengths and widths. Also contained in chapter five is a table giving the fibers that are used in various types of paper and board.

The work is concluded with chapter six, a detailed section on photomicrography, which includes notes on choice of equipment, mounting, and associated equipment. Use of the camera, choice of film, filters, and developing the film are also discussed here.

Easily read, clearly understandable, this "Atlas" should be useful for paper chemists, research men, students, and others interested in the scientific aspects of paper and its constituents. For anyone concerned with paper this is a convenient volume to possess, embodying a wealth of information apart from optical and chemical techniques.

"An Atlas of the Commoner Paper Making Fibres" contains 170 pages and is 8¾ x 11 inches in size. It is published by Guildhall Publishing Co., Ltd., 2 Wrentham Ave., London, England. Priced at $8.85, copies may be ordered from the Lockwood Trade Journal Co., Inc., 15 West 47 St., New York 36, N. Y.

BOLTON'S BLUE DEVIL HIGH SPEED KNIVES. (Bulletin CK-557) Describes a modern concept of custom crafting chipper knives for specific pulp mill chipping conditions and objectives. Also explains the efficiencies that can be expected through the use of chipper knives expressly made for each wood room. **John W. Bolton & Sons, Inc.,** 9 Osgood St., Lawrence, Mass.

DEXTER-CONDE DRI-AIR PUMP. (Brochure) Gives complete specifications and operating recommendations for the three sizes and capacity-ranges in which this pump is available. Also includes drawings and dimension tables, as well as information on two types of air filters. **Dexter Folder Co., Div. of Miehle-Goss-Dexter, Inc.,** Pearl River, N. Y.

MECHANICAL AND HYDRAULIC HAND LIFT TRUCKS. (Book) Discusses mechanical and hydraulic hand lift trucks—what they are, how they operate, how to select and use them. **Assn. of Lift Truck & Portable Elevator Manufacturers,** 1 Gateway Center, Pittsburgh, Pa.

PARA-FLEX FLEXIBLE CUSHION COUPLING. (Bulletin A669) Includes full view and cut-away photographs along with drawings to illustrate construction and installation features. **Dodge Mfg. Co.,** Mishawaka, Ind.

SANDY HILL-KAMYR PULP BLEACHING EQUIPMENT. (Catalogue Section 2, Part A) Deals specifically with pulp bleaching equipment designed by Kamyr and manufactured by Sandy Hill. **Sandy Hill Iron & Brass Works,** Hudson Falls, N. Y.

SILACASTIC SILICONE RUBBER. (Brochure 9-105) Includes a tabular summary of dielectric properties of typical stocks at temperatures from 25C to 250C. Also properties are illustrated with a variety of actual field applications. **Dow Corning Corp.,** 592 Saginaw Rd., Midland, Mich.

SPROUT-WALDRON'S BIG PLUS. (Bulletin 178) Shows how their equipment offers a combination of factors which provide the utmost in economy and efficiency in processing equipment. Also includes installation photographs and references to special applications. **Sprout, Waldron & Co., Inc.,** Muncy, Pa.

AUTOMATIC LOW LIFT PALLET TRANSPORTER. (Bulletin 1008-W) Gives complete specifications and drawings of this transporter, walkie-type electric-driven industrial truck, Model WPY 4 and 6. **Automatic Transportation Co.,** 149 W. 87th St., Chicago 20, Ill.

PAPER CONDITIONING. (Bulletin) Contains illustrated sales copy and partial list of users of these systems. **Vapo Systems Co.,** 126-32 W. Home Ave., Villa Park, Ill.

FUNCTIONS OF ACCUMULATORS ON LIFT TRUCKS. (Bulletin) Tells how these devices have been found to reduce shock impact to the load and lifting mechanism by as much as one-half. **Yale & Towne Mfg. Co.,** 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

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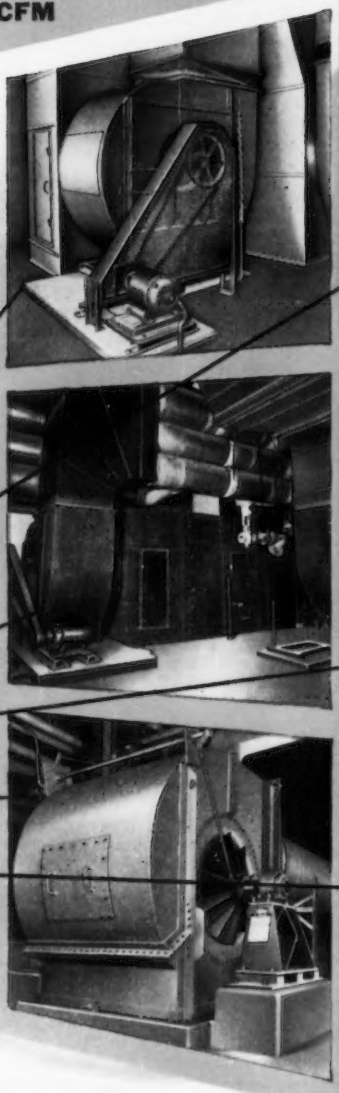

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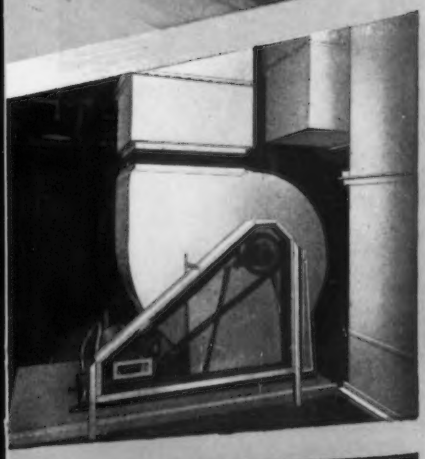

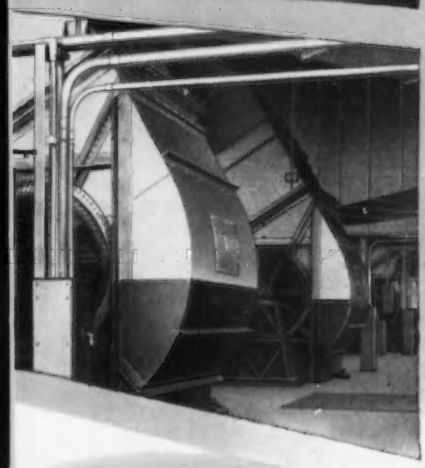

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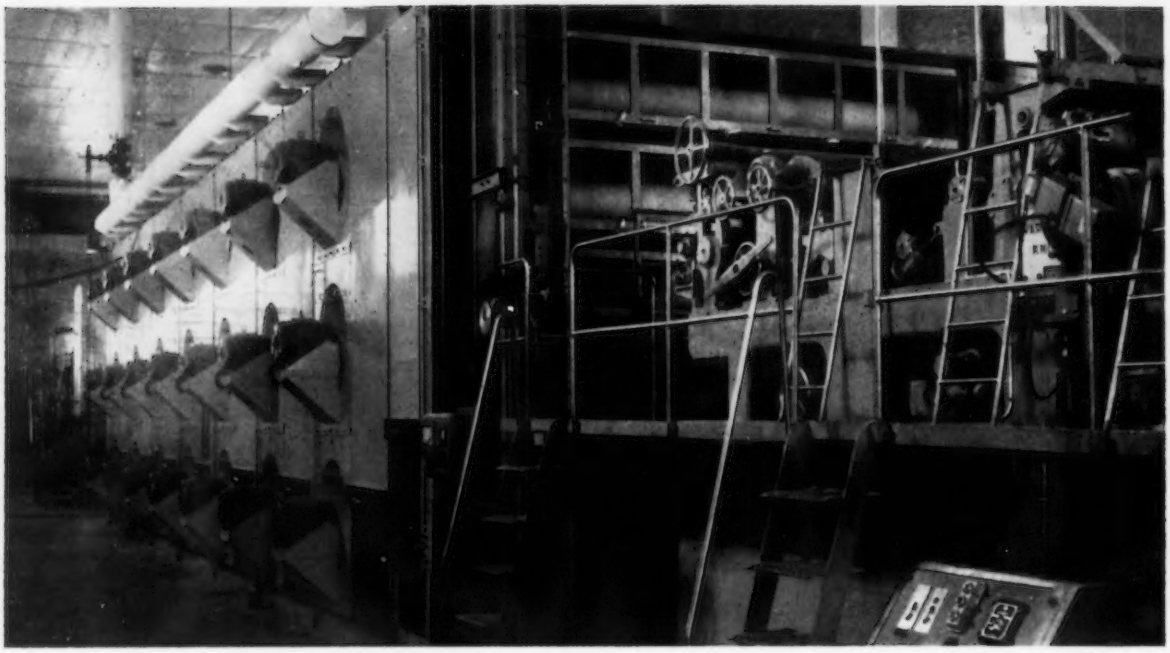


NEW TYPE FLAKT DRIER INSTALLED IN SWEDEN.

Many Advantages Are Obtained with New Flakt Pulp Drier at Oskarstrom Mill

Lars Grundberg

Chief Engineer, Oskarstrom Sulphite Mills AB.
Oskarstrom, Sweden

In connection with the projected expansion for production of market pulp at Oskarstrom Sulphite Mills AB a few years ago, one of the prime problems was the need for a completely new pulp drier. The existing drier was old and it was not considered worthwhile to rebuild it for greater production.

The mill site located between the river Nissan and the Halmstad-Nassjo railroad offered only very limited possibilities for erection of a new larger building to contain a pulp drier of increased capacity. Even by moving the rails 16 feet, the maximum space made available for a new machine room would be only 187 feet in length. This space was insufficient for a conventional pulp drier of the capacity required. However AB Svenska Flaktfabriken of Stockholm had just completed research work and test runs on its new type L Flakt drier, which uses air instead of a mechanical conveyor to carry the sheet through the drier. With this new design the length of the drier could be reduced by about 40 per cent. The decision was made to make the first full scale commercial installation of this new drier, which was installed, together with other new equipment, the latter part of 1955.

Description of Machine

The new machine at Oskarstrom includes a wet end with a vacuum forming-cylinder and three presses. Located between the second and third press is a Flakt pulp sheet pre-heater. Following the last press is the new type L Flakt drier with air borne web and finally the cutter, layboy, bale presses, and handling equipment. The working width of the drier is 126 inches and production is 110 to 120 short tons of pulp per 24 hours. Machine speed is adjustable between 50 and 150 f.p.m. At present the machine is being used on several grades of unbleached sulphite pulp.

AB Svenska Flaktfabriken, the drier manufacturer which for many years has specialized in building pulp driers, built a full width experimental unit which

had been tried out at another pulp mill in Sweden. This new type Flakt drier has no mechanical conveyors whatsoever. The pulp sheet is transported by and floats upon air currents which are fed by fans through distributors located under and above the traveling sheet of pulp.

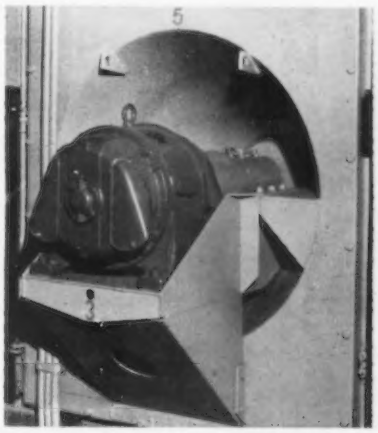
In the installation at Oskarstrom, the pulp sheet is carried from the wet end into the upper part of the Flakt drier and is then fed back and forth on 11 horizontal decks. It leaves the machine at the bottom of the dry end. The new drier has a height of 16 feet, a width of 20 feet and a total length of only 60 feet. The normal steam pressure at the heating coils is 60 p.s.i.g. The drier is made up of fourteen identical vertical sections, each one 4 feet long. The sections are equipped alternately with doors on one side and with fans and heating units on the other side. Each section has three of these fans which are all the high pressure type. The heating units are made from copper tubing with aluminum fins. Screens are placed in front of each heating unit in order to keep out loose pulp fibers or other material.

At the end of each horizontal deck the sheet turns around perforated rolls. Vacuum is applied to these rolls when threading the sheet to carry the sheet around and reverse its direction. Dancer rolls are placed on the pulp sheet just before it enters and after it leaves the drier. These rolls send impulses to the drier drive and the cutter motor for control of the speed of these units, thus the tension in the sheet is kept independent of variation in basis weight and dryness. The sheet leaves the drier at 100 per cent a.d.

The new drier at Oskarstrom was put into continuous operation the first of January 1956, and has now been operating 20 months. The plant is in continuous 24-hour operation, six days a week so that the drier is shut down every Sunday and started up again on Monday morning.

Threading

At the start-up the tail of the pulp sheet is, as customary, carried forward through the wet end on the operating side of the machine. After having passed through the pre-heater and the last press, the pulp sheet is raised by means of rolls until it is level with the intake rolls of the drier. The sheet is allowed to fall to the floor until it has reached its full width, then, about 20 inches are cut off each side at the forming cylinder. The width of the sheet is thus temporarily reduced by 40 inches. This temporary reduction in the width of the sheet is helpful while it is being threaded through the first decks, as it allows room for possible lateral movement before the sheet has reached full tension. Directly in front of the drier intake is placed an automatic air operated device which cuts a tail in a rather blunt point symmetrical with the center line of the sheet. After being cut, the pulp sheet with the tail is carried forward by an air jet and is fed into the drier between a pair of rolls which pull the sheet in. Thereafter it is carried by an air current to the end of the first deck. Here it turns around the perforated vacuum roll and is carried in a reverse direction through the second deck. The operation continues in the same manner through the 11 decks of the machine. In the Oskarstrom installation, due to space limitations, the dancer roll after the drier, and the feed rolls carrying the sheet to the cutter, have been placed in the basement. When starting up all fans are turned on immediately before the sheet is passed into the drier. The fans and all control devices are directed from a control panel which is placed in line with the drier intake. This control panel also reports temperatures in various sections of the drier and the machine room. As soon as the pulp sheet reaches the cutter, air volume, steam pressure, etc. are set for normal operation.



INDIVIDUAL DRIVE MOTOR FOR FAN.

Effect of Power Cut-off

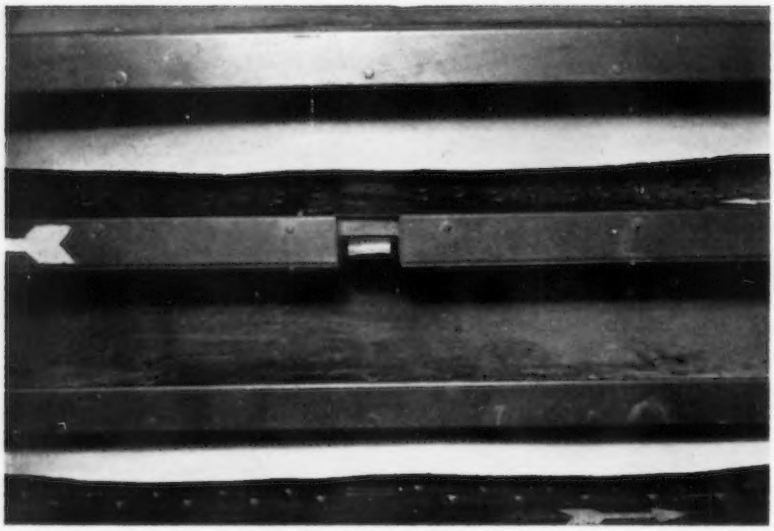
Our experience has been that if one or more of the fans should fail, the effects are minor. We have had a motor kick out without upsetting the operation. We have also made tests where all three motor fans in one section have been cut out. This did not effect the operation of the drier except in that the drying capacity was reduced. When shutting down the drier, it is advantageous to tear off the sheet straight across at the entrance, and as this last part of the sheet is going through, to shut off the fans entirely in every third or possibly every other section in order to cut down on any tendency for the tail to wave about. It is only very rarely

Pulp Sheet Pre-Heater

A pulp pre-heater, as referred to by the author, has been installed in this country but we have not seen a description of it published. We therefore include the following outline.

The pulp web is conveyed in vertical loops over a number of guide rolls through the pre-heater. Because of the low strength of the wet web, the distance between the upper and lower guide rolls has been restricted to about five feet. The upper guide rolls are mechanically driven from an intermediate shaft. The lower guide rolls are driven by the pulp web. Between the loops of the web there are trapezoidal air-distribution ducts of rectangular cross-section, with their largest area on the drive side of the machine. Above them there are similar ducts, with their wide end on the operating side of the machine. In both cases these air-distribution ducts are connected to collecting boxes outside the actual pre-heating zone. The lower sides of the lower distribution ducts are fitted with perforated plates which distribute the moist air over the whole width of the web.

After passing through the heat-recovery unit for heating the Flakt-Dryer intake air, part of the moist air from the drier is led to the pre-heater, where it enters at the bottom of the collecting box at the operating side of the pre-heater. The air is then forced into the trapezoidal distribution ducts and passes out through the perforated plates in the lower part of the ducts of high speed perpendicular to, and on both sides of, the lower part of the web sections. The air is then turned and led vertically upward along both sides of the web sections and returned through the slots in the tops of the upper ducts to the collecting box on the operating side of the pre-heater.



AIRBORNE SHEET IS CARRIED THROUGH DRIER. Note angled air outlets below sheet. Similar outlets above the sheet are not visible here.

that any pieces of pulp remain in the drier at a shutdown.

It has happened that due to a power failure the entire operation of the machine has been stopped. On such occasions the steam for the heating coils was shut off and as soon as power was restored the pulp sheet was started again without any trouble. Normally the new drier at Oskarstrom operates with the sheet weighing 700 to 1000 grams per square meter (430-615 pounds per 3000 square feet). However it has happened that due to temporary fluctuations in pulp supply, the sheet weight has gone down to 300 grams (185 lbs./3000 sq. ft.). Even this thin sheet has been fed through the machine without trouble.

Heat and Power

This new drier has a higher electric power consumption. However, most of the power input to the motors is recovered in the form of heat in the air in the dryer which is used in drying the pulp, so that a correspondingly smaller amount of steam is consumed. Power consumption runs about 73 k.w.h. per ton of pulp.

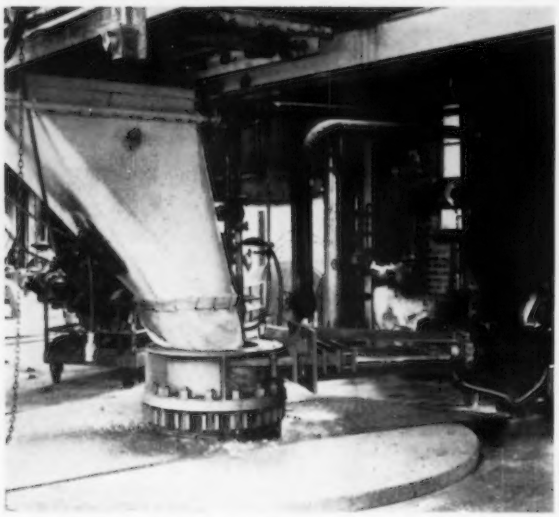
The drier installation at Oskarstrom contains extensive equipment for heat recovery. The warm moist air from the drier first passes through a heat exchanger which is used to pre-heat the air entering the drier. From the heat exchanger the drier exhaust exit air is blown to the pulp pre-heater located between the presses, to warm up the sheet from 85 to 130 degrees F. Then the air passes through a heater to warm up the water used at the wet end of the machine. The warm water heater heats about 200 g.p.m. of water to about 120 to 130 degrees F. Finally in the winter it is passed through an economizer to warm the machine room ventilation air.

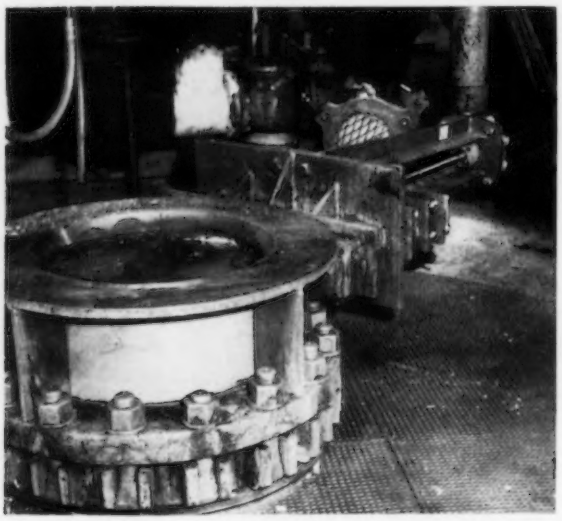
Due to the relatively high temperature of the sheet at the presses, the solids content of the sheet entering the drier is quite high, around 45 per cent. As stated previously the sheet leaves the drier at 100 per cent a.d. The amount of heat supplied to the drier in the form of steam is equivalent to about 1150 B.t.u.'s per pound of dried pulp.

Conclusions

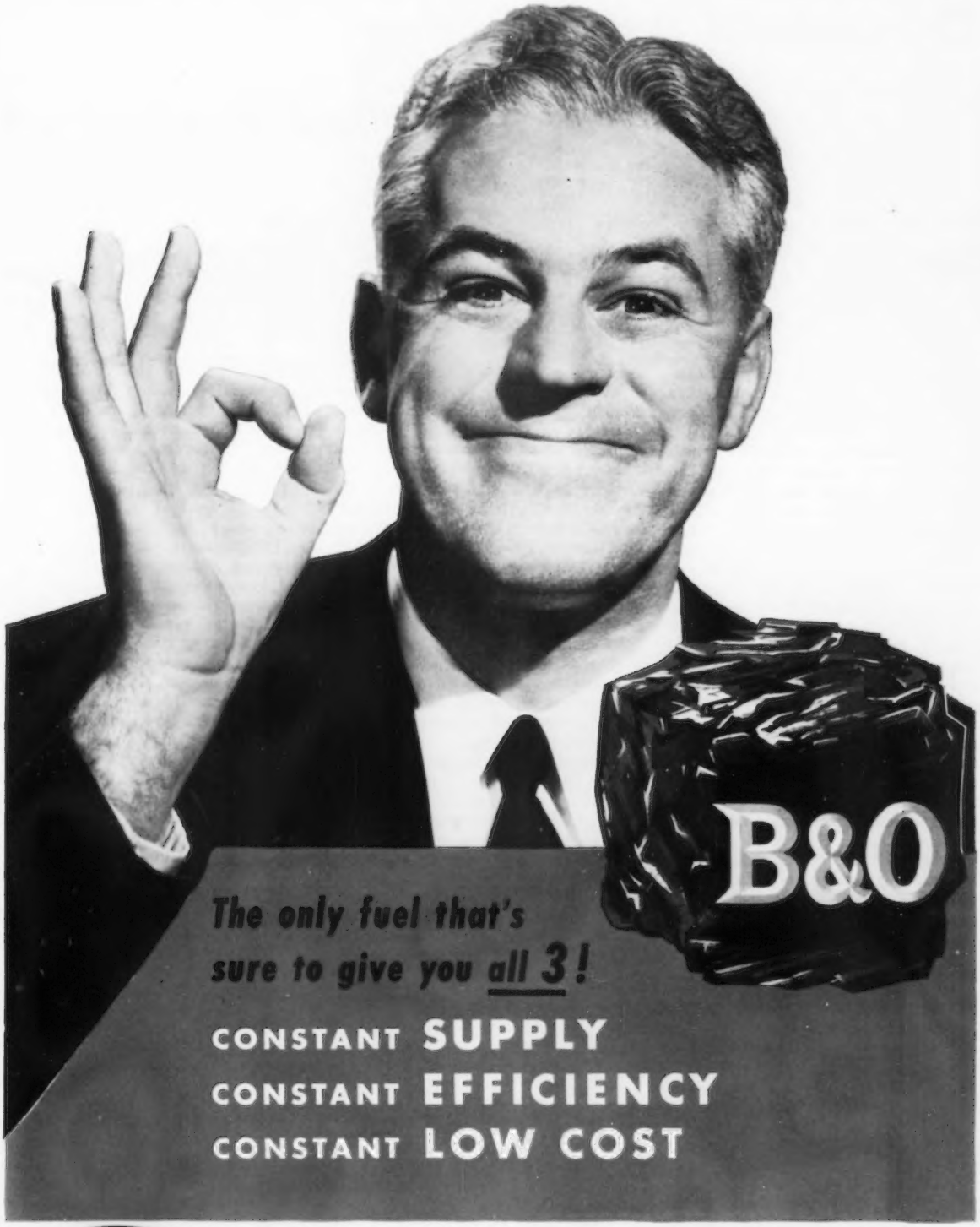
While this new type of air drier has retained all the advantages of the earlier air drying method, it has simultaneously eliminated weaknesses in the previous models. The absence of mechanical conveyors permits much higher operating speeds. Also this does away with maintenance and lubrication costs, as well as eliminating production shutdowns for conveyor repair or replacement. The danger of soiling the sheet with oil or oil soaked fibers has been eliminated. Further the smaller size of the new drier reduces construction costs.

New Valve Type Covers on Union Bag-Camp Digesters





UNION BAG-CAMP CORP. has installed valve type covers on three of the kraft digesters at its Savannah, Ga. mill. The picture at the left shows the valve open while the digester is being charged with chips. At the right, the valve has been closed and the digester is under pressure. Valves were supplied by Fabri-Valve Co., Portland, Ore.



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Theoretical Aspects of Groundwood Production

Dr. K. H. Klemm

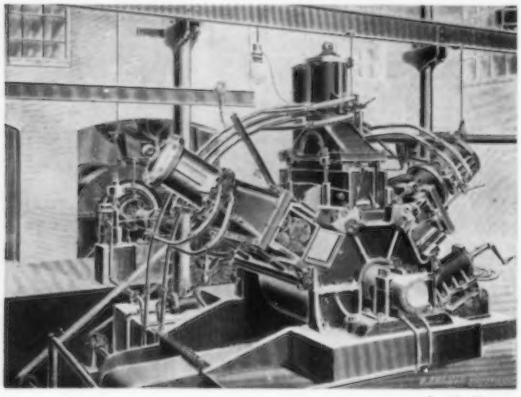
Manager, München Dachauer Papier Fabriken
Munich, Germany

Preparation of English text by G. P. Chinn, Control Supt.
Anglo-Newfoundland Development Co., Grand Falls, Nfld.

Following Keller's invention, the development of grinders advanced very rapidly (1,2). With the original grinders, the pressure of the wood against the stone was achieved by spindles which later on were replaced by teeth and gears. The load on these grinders was about 100 hp. After some experimentation (right angle grinder with vertical shaft, diagonal grinding) the principle of right angle grinding was chosen and has been maintained to the present day. During the decade 1860-70, the application of hydraulic pressure was patented by the engineer Siebrecht of Kassel (for a grinder with vertical shaft). This was first used in North America and only introduced later (1880) into Germany. A very important step was made in North America with the introduction of hot grinding. As a result of these new possibilities, Olin Scott developed the "England grinder" which was equipped with two, and later three pockets and was capable of taking a load of 270 hp. The introduction of hot grinding into Europe followed the work of Professor E. Kirchner. Based on his experiments and suggestions, "high power grinders" were developed. During the World Exhibition in Paris in 1900, Bell & Co. exhibited a "hot grinder" with three pockets and a stone 56 inches in diameter and 22 inches wide, and which was able to take a load of 300 hp. at 225 r.p.m. With the increasing load, it became necessary to give attention to the control of pressure. Schmitthenner (3) developed a governor for hydraulic high power grinders which made it possible to maintain, closely, stone speed. To meet the general requirements for increased production, J. M. Voith, in 1904, constructed the first "super grinder" for 3.3-foot wood lengths and designed for a load of 670 hp. The first installation was in the groundwood mill of E. Holtzmann & Co. at Weisenbach, Germany (Figure 1).

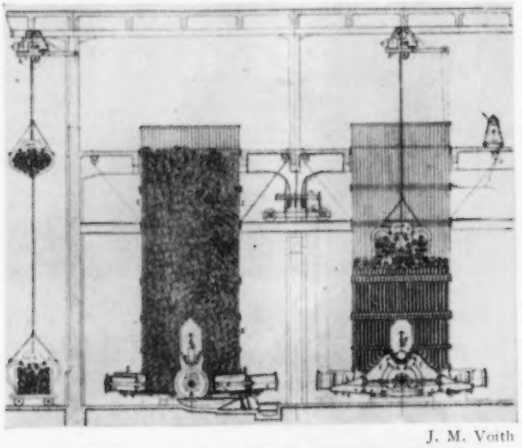
To eliminate the time loss during the change of the presses and to reduce manpower, the magazine grinder was developed and a patent granted to J. M. Voith in 1908 (4). This grinder type became particularly popular in North America where it is still in common use (Figure 2). The next development, aimed primarily at obtaining continuous feed of wood against the stone (5), was interrupted by the First World War but about 1920 both J. M. Voith and J. Warren brought out continuous grinders. These were able to take loads up to 1000 hp. A continuous grinder using spindles and based on the work of Nenzel (6) was further developed by the firm Füllner at Warmbrunn, Germany, which also brought out the 1350 hp. DD grinder (Figure 3). Besides this, the pocket grinders were also improved. The firm Miag of Braunschweig developed a four-pocket grinder, the so-called "twin" grinder which was built to take a load of 1000 hp. and, in 1923, Kamyr came out with a continuous two-pocket grinder. In 1929, the Great Northern grinder was developed in North America and gained favorable attention. The most recent of these were built for a load of 5000 hp. with five-foot wood lengths. In Europe, the chain type grinder is the preferred design. The largest of its type is planned for Risör (Norway) for a load of 6700 hp. and 6.5 foot long wood.

All these developments had to be made on a purely empirical basis because, until recently very little was known about the fundamentals of the



J. M. Voith

FIGURE 1—HYDRAULIC POCKET GRINDER (1904)



J. M. Voith

FIGURE 2—MAGAZINE GRINDER (1910)

grinding process. Only recent research work has thrown some light which may provide a better basis for the further development of wood grinders.

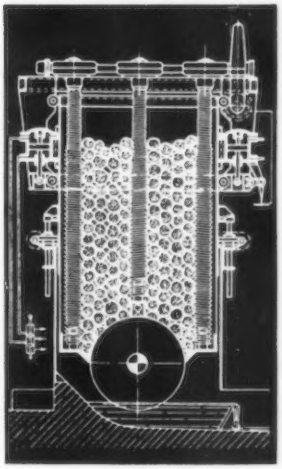
Theory of Wood Grinding

There are numerous and serious difficulties connected with the investigation of the grinding process which are related chiefly to the heterogeneity of the wood but also to the many variables of the process itself. Both can influence the results considerably. Due to these difficulties, which may be characterized by the fact that the properties of the groundwood produced are subject to both short and long time fluctuations, only a few people have had the patience and time to devote their attention to the grinding process. Testing of spot samples taken from the grinder pit may result in very erratic readings and most probably the failure of much of the work done in this field is related to this fact. The heterogeneous nature of the raw material (wood) must be understood and much attention paid to this fact during the planning of research on grinding. This requires time-consuming and extensive trials. In addition, comparison of results is very difficult as the quality of groundwood can not be defined properly but fluctuates with the freeness. Better presuppositions for the evaluation of the test results during wood grinding were established when Brecht and his co-workers (7) developed a special groundwood technology.

A Working Concept for Wood Grinding

Since the early days of wood grinding, the problem of how to find the basic fundamentals of the grinding process was acute. No satisfactory answer could be evolved. Brecht and Mueller (8) and later Brecht and Schuster (9) had pointed out that during wood grinding, two different actions should be separated. They can be characterized as a defibering and a beating or refining process. Based on this, Klemm (10) tried to find a more complete analysis of the proceedings during wood grinding.

According to his concepts, it is recommended that the proceedings during wood grinding be divided into a primary and a secondary process. During the *primary process*, at first the substance between the fibers consisting mainly of lignin becomes plasticized by the high temperatures (in the range of 360-380°F.) which are developed by the heat generated in the grinding zone. This is called the *pre-initial* process. During the following *initial* process, the wood is defibered by the brushing effect of the grits on the stone surface. The *secondary process* includes the beating or refining of the fibers and fiber bundles produced in the primary stage and includes the effects of re-grinding.



J. M. Voith

FIGURE 3—FÜLLNER DD GRINDER (1926)

These concepts are hypothetical insofar as it is not possible to get separate samples of the primary or secondary groundwood. In practice, there is no effective separation between the primary and secondary stages. The refining or beating of already loosened fibers and the additional loosening of more fibers goes on at the same spot in the grinding zone and are superimposed on each other. In spite of this, the hypothesis of a primary and a secondary process is very useful for picturing the proceedings and enables the explanation of at least some of the effects involved.

Pre-Initial Part of Grinding Process

From the foregoing concepts, one can conclude that the temperatures in the grinding zone have a marked effect on the quality of the groundwood produced. The general opinion, until now, was that the temperature in the grinding zone is not considerably higher than the temperature in the grinder pit (field **d** in Figure 4) and does not exceed the boiling point of water (point **c**). However, taking into account the normal conditions during practical operation, a relatively simple calculation* shows that temperatures between 360-380°F. must be considered to exist in the grinding zone (Figure 4). The curves **a** and **b** of this figure were drawn from the results of such calculations and show the temperature in the grinding zone as dependent upon the consistency in the grinding zone. The curve **a** was calculated with the assumption that dilution in the grinding zone is achieved only by stock and water from the grinder pit and the curve **b**, with the assumption that it is achieved only by the addition of white water. The fact that the two curves are very close together proves that it is not very

***Example calculation of Temperature in the Grinding Zone:**

(a) Calculation of the heat generated, Q, per ton (o.d.) groundwood assuming: grinder-pit temperature 176°F., white water temperature 138°F., wood temperature 68°F., wood moisture content $w_f = 30\%$, consistency in the grinder pit 2.5%:

$$Q_e = 2000 \times 0.65\ (176—68) + \frac{2000\ (1—0.7)}{0.7} \times 1.0 \times (176—68) + 77140 \times 1.0\ (176—138)$$

(Heat to raise temperature of the wood; Heat to raise temperature of water in the wood; Heat to raise temperature of white water)

$$Q_e = 3{,}160{,}000 \text{ B.t.u.}$$

(b) Calculation of the quantity of heat in the grinding zone, Qv, assuming: Stock consistency in the grinding zone to be 14%; (datum 32°F.):

$$Qv = 3{,}160{,}000 + 2000 \times 0.65\ (68—32) + \frac{2000\ (1—0.7)}{0.7} \times 1.0 \times (68—32) + 11400 \times 1.0\ (138—32)$$

(Q_e + heat content of wood; Heat content of water in the wood; Heat content of white water)

$$Qv = 4{,}450{,}000 \text{ B.t.u.}$$

(c) Calculation of the temperature in the grinding zone, t_s °F.

$$t_s = \frac{Q_v}{2000 \times 0.65 + \frac{2000\ (1—0.7)}{0.7} \times 1.0 + 11400 \times 1.0} + 32$$

$$t_s = 359°\text{F.}$$

important whether the dilution is obtained in one way or the other*.

In both cases, at about 14 per cent consistency (point é), the temperature range for lignin plasticization is reached. Actual measurements of the stock leaving the grinding zone gave consistencies between 18-20 per cent (point é). This difference must be due to the heat transferred by the stone and heat losses which were not considered in the above calculations.

The above example is based on average conditions. From Figure 5 it can be seen that the amount of heat generated during grinding fluctuates considerably according to the condition of the stone surface. This is also indicated by the specific energy consumption variations. With very sharp stones, the heat generation may decrease to about 2,000,000 B.t.u. ton (o.d.) requiring the temperature in the grinding zone to drop to about 325°F. This temperature is below the limit for lignin plasticization and, in fact, groundwood from very sharp stones has the typical features of "cold" groundwood. On the other hand, grinding with very dull stones may result in the generation of about 4,500,000 B.t.u./ton (o.d.) and the related high grinding zone temperature may lead to the well-known burning of the wood.

As shown in Figure 5, heat generation is not exactly equivalent to the specific energy consumption. The heat generation per ton of groundwood decreases with increasing load as does the specific energy consumption, but at a faster rate. If this difference in rate is considered as the "energy used for refining," the coarser fibers which result from high load grinding can be explained. Most probably, during the grinding process, automatic control of the upper limit of the temperatures in the grinding zone is achieved. With the increasing temperatures, the lignin becomes increasingly softened. This makes the defibering easier so that less of the energy applied is converted, by friction, into heat. The existence of such a control seems to be important because the temperature difference between the normal operation and the burning of the stone is very small (compare point **a** and field **b** in Figure 4).

In this connection, there is a common misunderstanding regarding the temperatures carried in the grinder pit. With the introduction of hot grinding, the temperatures in the grinder pit had to increase because of the rise of the white water temperatures to the range 120-140°F. As a result of this, the opinion is held, even today, that the temperature in the grinder pit is the important feature of "hot grinding." This, however, is true only if the temperature increase is achieved by higher white water temperatures at the same or lower grinder-pit consistency and not by reducing the amount of dilution water with corresponding increase of the consistency.* Generally, for investigations of the grinding process, the important figure is the heat generated per ton and not the pit temperature.

Initial Part of the Grinding Process

During the initial part of the grinding process, defibering of the wood occurs. Brecht (9) has emphasized that the plastic properties of the wood are very important to the quality of the groundwood produced and, from this, explained the obvious advantages which can be observed when grinding wood which has a high moisture content (above 30%). In developing these concepts further, Klemm (10) introduced the term "Initial Grinding Time" which is defined as the time in which one point of the stone surface passes the grinding zone. Normally, this is in the range of 50-60 milliseconds.†

With the introduction of the "Initial Grinding Time," it can be demonstrated that the defibering operation during the initial process is very much influenced by the rate of feed of the wood during this time interval (Figure 6). From the structure of wood substance, it becomes evident that optimum conditions must prevail if the rate of feed is just equal to the prevailing diameter of the wood fibers. To characterize the ratio between the rate of feed during the Initial Grinding Time and the prevailing fiber diameter, Klemm introduced the term "Initial Grinding Factor." If both numbers are the same, the Initial Grinding Factor is one. This definition represents the most favorable conditions for the production of a high percentage of long and unbroken single fibers (Figure 6). If the Initial Grinding Factor is decreased by the rate of feed becoming smaller than the prevailing fiber diameter, an increasing percentage of the fibers are cut longitudinally (with green wood) or shattered and broken (with dry wood) and the freeness of the resulting pulp decreases. If the rate of feed of the wood during the Initial Grinding Time is greater than the prevailing fiber diameter, more fiber bundles and splinters are produced in the initial process and the freeness increases.

It must be realized, of course, that the diameter of the fibers in the wood varies considerably (from 24-34 microns for spruce). Indeed, the structural composition of groundwood shows this fact.

*Compare the results observed during "pitless grinding".

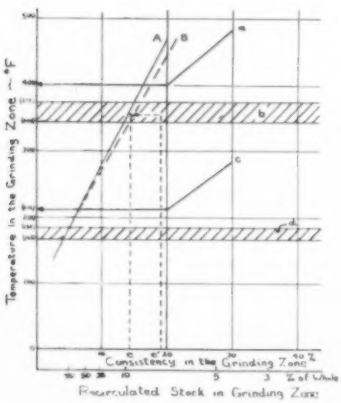

Temperature in the Grinding Zone — °F
Consistency in the Grinding Zone
% of White Stock
Recirculated Stock in Grinding Zone

FIGURE 4 — TEMPERATURE AND CONSISTENCY IN THE GRINDING ZONE

A—Dilution with stock and water from the grinder pit
B—Dilution with shower water only.
a—Temperature of burning of wood; b—Field of lignin plasticization; c—Boiling point of water; d—Temperature in the grinder pit; e—Theoretical consistency in the grinding zone; e¹ — Measured consistency in the grinding zone.

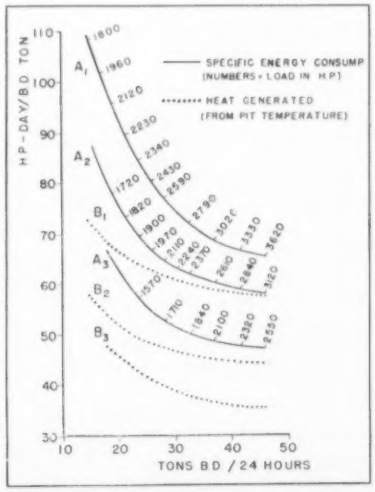


FIGURE 5 — HEAT GENERATION AND SPECIFIC ENERGY CONSUMPTION FOR DIFFERENT STONE SURFACE CONDITIONS AND LOADS

A—Curves for specific energy consumption; B—Curves for the heat generated (according to the temperature in the grinder pit); 1—With dull stones; 2—With normal stones; 3—With sharp stones (the data on the curves show the load in hp.)

*The successful application of temperature control in the grinder pit, as commonly practiced in North America, is related to other factors arising from the discontinuous operation of most grinders used there.

†1 millisecond = one thousandth of a second; 1 microsecond = one millionth of a second.

This means that the theoretically correct rate of feed is not attainable but the optimum average, depending upon the wood available, should be determined. This concept can be used to explain the higher capacity, at the same pulp quality, of a grinder operating on green instead of on dry wood. The swollen fibers have a larger diameter and, in addition, are more elastic. Furthermore, it can explain why wood with small diameter fibers (poplar) must be ground with a considerably lower load; the lower load results in a lower rate of feed. Consequently, wood with large diameter fibers allow a higher rate of feed and, therefore, will give higher grinding capacities.

Another factor influencing the defibering action during the initial process is the size of grits in the grinding stone. The concept of the brushing out of the fibers from the wood illustrates that, with fine grit stones, only thin fibers can pass between the grits while, with coarser grits, increasingly thicker fibers and even fiber bundles and splinters may be preserved intact. The choice of the grit size, therefore, is also a factor which influences the effects from the primary process and must be made with regard to the properties required in the final groundwood.

The Secondary Process

The secondary process includes all proceedings which are related to the further refining of the groundwood produced by the primary process. In this case the stone must really be considered as a grindstone and terms such as "grinding area" and "open surface" which are related to stone sharpening are important. During the actual grinding process, the stone surface is worn away through the removal of more and more grits. The area which is exposed to the wood becomes polished and at the same time the depth of the sharpening pattern decreases. Klemm (10) succeeded in proving that the "average depth of the sharpening pattern" considerably influences the effects involved with the secondary process. This term is defined as being equivalent to the annular distance between two cylinders, one of which would be formed by the stone and the other by the stone minus the volume of all cavities. Figure 7 illustrates how this distance can be established. The measurement is relatively complex and can be made, for example, by making a plaster cast of the stone surface. A projected cross section of this cast is easily measured and can be used for the evaluation of the average depth of the sharpening pattern. If the ratio of the volume of wood to the volume of the stone cavities is called the "Final Grinding Factor," it is apparent that the refining action increases as this

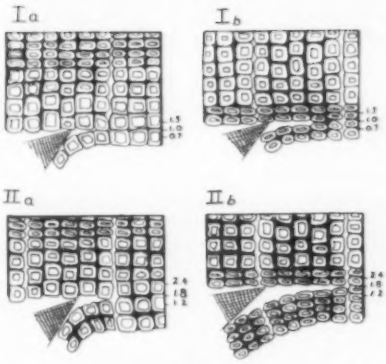


FIGURE 6—DEFIBERING OF WOOD AS DEPENDENT ON THE RATE OF FEED

I—Initial grinding factor small; a) with springwood; b) with summerwood. II—Initial grinding factor large; a) with springwood; b) with summerwood (The numbers indicate the initial grinding factor)

FIGURE 7—EVALUATION OF AVERAGE DEPTH OF SHARPENING PATTERN

p—Average depth of sharpening pattern; a—Depth of the pattern as measured; n—Number of measurements.

value increases because more fibers become exposed to the refining action. In addition to the open area of the stone, the condition of the actual grinding surface is important (7). As long as this is rough and contains numerous grits, the cutting action, which produces flour-like fines, predominates. Fibrillation, with its corresponding valuable fibrilplasma fines, becomes more and more prevalent as the stone surface smoothness increases.

The operational possibilities related to the control of the stone surface by sharpening will be dealt with in a later part. Within the present considerations, the well-known fact that grinding is cheaper than refining is apparent from the principles of the primary and secondary processes. It is advantageous, therefore, from the economic point of view, to achieve the required diameter of the fiber or fiber bundles in the primary process and to control the secondary process to give only as much refining as is necessary to give the desired strength properties. If, during the primary process, by the use of too coarse grit stones and/or too high loads, the fibers produced are coarser than acceptable for the properties of the final groundwood, it is necessary either to refine more during the secondary process or to transfer a high percentage of the pulp later to the refiners. In both cases, the energy consumption is increased compared with that which would have resulted with the proper balance between the two actions during grinding. The explanation for this is that the heat developed in the grinding zone has not been used to its full extent and, therefore, additional energy must be spent afterwards in order to attain the fineness required. All these considerations show that the economic optimum can only be achieved with close attention to a large number of complex factors.

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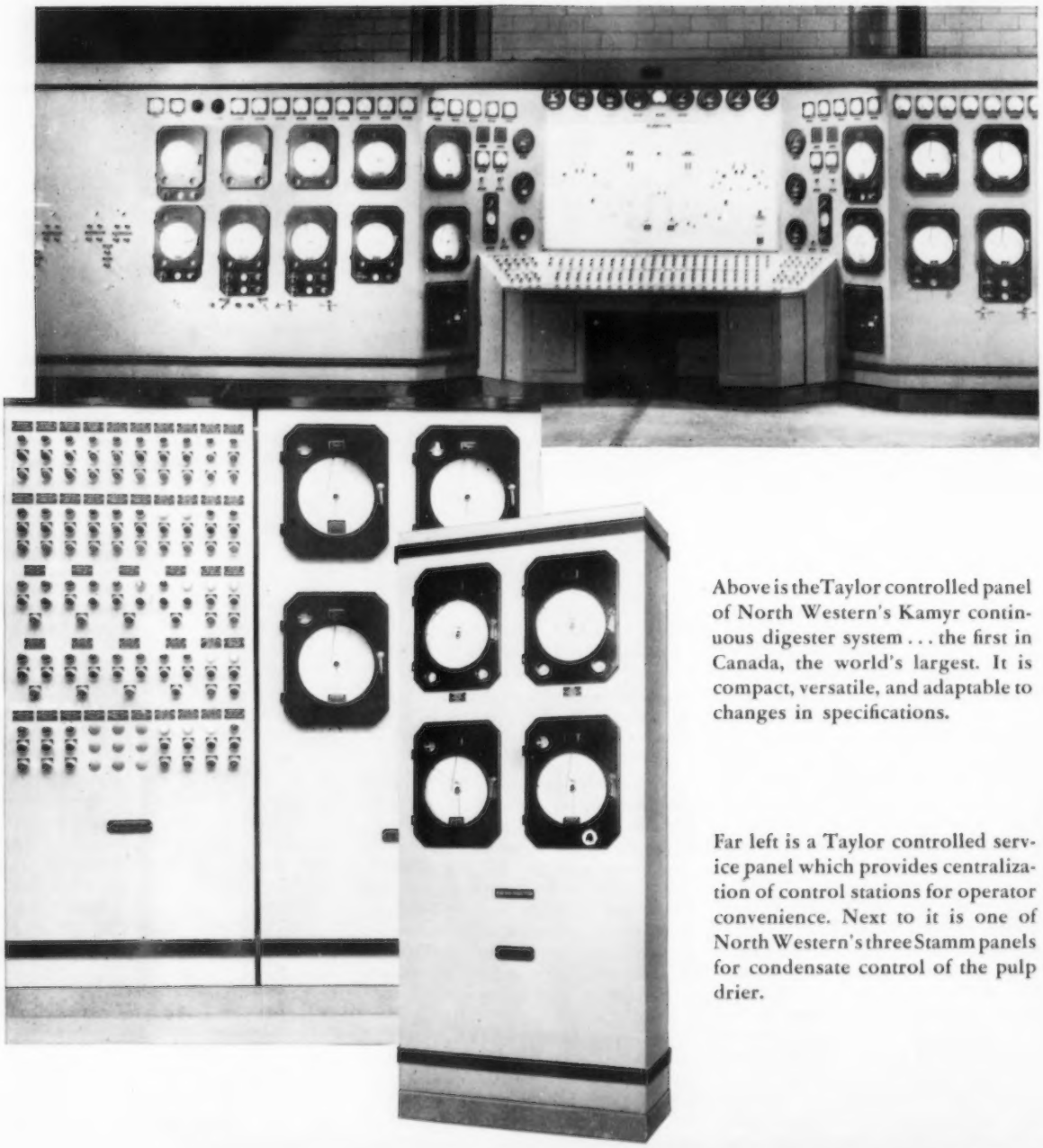


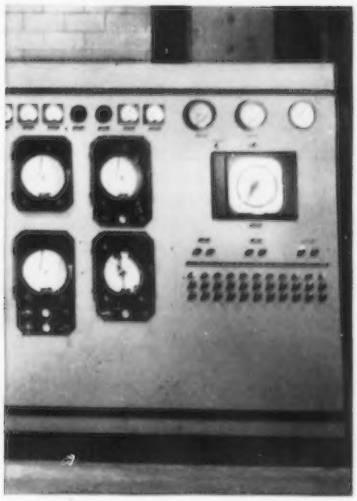
Above is the Taylor controlled panel of North Western's Kamyr continuous digester system . . . the first in Canada, the world's largest. It is compact, versatile, and adaptable to changes in specifications.

Far left is a Taylor controlled service panel which provides centralization of control stations for operator convenience. Next to it is one of North Western's three Stamm panels for condensate control of the pulp drier.

Taylor Instruments

North Western Pulp and Power Ltd.

PULPING OPERATIONS



AT LEFT you see the *world's largest* Kamyr continuous digester system. It's located at the Hinton, Alberta, bleached sulphate mill of North Western Pulp & Power Ltd. and is controlled by Taylor instruments.

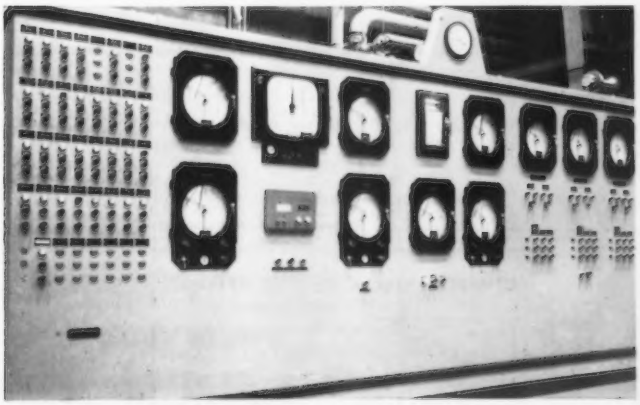
North Western's high standard product, ALBERTA HI-BRITE, demands precise quality control, and this efficient new 150,000 ton mill was designed from top to bottom to provide that control. Taylor's long experience in instrumentation was called upon . . . just as it is every day by so many industries. H. A. Simons Ltd. were Consulting Engineers.

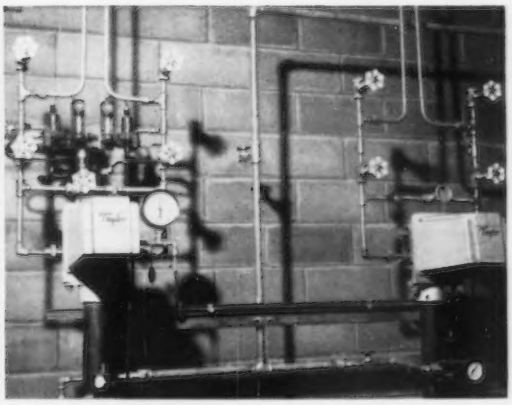
If you have an instrument or system problem, call your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester, N.Y., and Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Below is the Taylor panel controlling the final operation of the stock preparation system, as well as part of the pulp drier wet-end.

Taylor differential-pressure transmitters. On the left is a purged-level transmitter. On the right, a flow transmitter.





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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Aug. 10	Aug. 17	Aug. 24	Aug. 31	Sept. 7
1957	90.4	91.3	91.8	89.2r	73.2
	Aug. 11	**Aug. 18**	**Aug. 25**	**Sept. 1**	**Sept. 8**
1956	96.3	96.2	96.9	97.0	76.8

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	93.9	96.5	96.6	95.3	93.6‡	92.5‡	74.9‡	90.5‡					
1956	99.6	102.6	102.9	102.5	101.8	99.9	85.6	96.7	94.3	99.5	97.6	90.9	97.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1950	1951	1952	1953	1954	1955	1956	1957
Year to Date	95.1	99.2	90.5	92.9	91.2	94.4	98.4	91.2
Year Average	95.8	98.0	88.6	92.3	91.6	94.9	97.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

COMPARATIVE WEEKLY SUMMARIES

	Aug. 10	Aug. 17	Aug. 24	Aug. 31	Sept. 7
1957	92	94	95	95	72
	Aug. 11	**Aug. 18**	**Aug. 25**	**Sept. 1**	**Sept. 8**
1956	95	95	94	95	71

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	91	94	94	92	93	91	72	94					
1956	100	100	99	100	99	98	77	95	89	96	93	84	94

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

#Includes Labor Day Holiday

ITEM	THIS WEEK ENDING Sept. 7, 1957	LAST WEEK ENDING Aug. 31, 1957	CUMULATIVE TO DATE Jan. 1 to Sept. 7, 1957
% Activity	72%	95%	90%
	Tons	*Tons*	*Tons*
Total Production	214,792	290,919	9,569,734
Liner	69,423	109,524	3,281,998
Corrugating Material	32,312	46,284	1,458,304
Chip & Filler Board	4,872	4,602	188,669
Total Containerboard	106,607	160,410	4,928,971
Folding	41,935	53,075	1,767,504
Set-Up	10,127	11,090	390,603
Special Food Board	17,740	24,400	852,105
Other	38,383	41,944	1,630,551
Total Boxboard	108,185	130,509	4,640,763
Total Orders	*Tons*	*Tons*	
Received	339,419	265,643	
Unfilled End of Week	540,109	418,314	

OBITUARIES

Campbell Bosson, Secretary-Treasurer of the National Shoe Board Fibre Conference, died September 11. He had been associated with the shoe board industry for 33 years, and was a member of both the Massachusetts Bar Assn. and the American Bar Assn.

William E. Moser, 79, died September 8 at his home in Cleveland after a long illness. He was an executive of the old Cleveland Paper Co. before the end of the last century. He served as administrator of the Association of Paper Bag Manufacturers of the United States and, in 1927, organized his own bag and paper company, heading it until his retirement in 1945.

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Large Southern paper mill has excellent opportunity for experienced coating technical coordinator to head large new program. Thorough knowledge and experience with coating on the machine, of a variety of Fourdrinier bleached boards and paper required. He must have the ability to lead a program in developing new types of functional coatings. Good salary, liberal retirement and insurance program, plus other benefits. Replies held in strict confidence. Our employees know of this ad. Send detailed resume to Box 57-259 care Paper Trade Journal.

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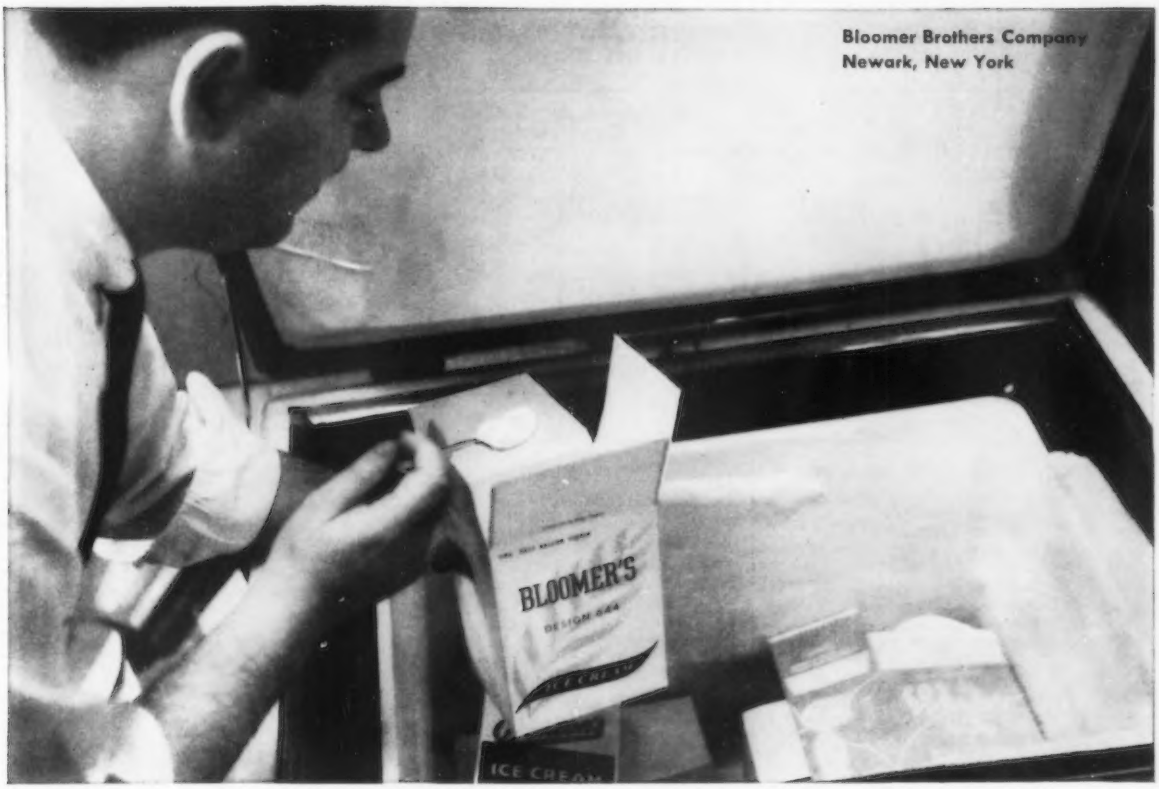


Bloomer Brothers Company
Newark, New York

Taste is the Surest Test of Bloomer Cartons and Cities Service Wax

You might say that choosing the wax for an ice cream carton is a matter of taste . . . or lack of it.

For the job of an ice cream carton is to protect the ice cream's flavor. And the job of the wax is to protect the carton, not flavor the ice cream.

From this elementary observation, Bloomer Brothers—probably the largest ice cream carton manufacturer in the U. S.—has built the highest possible standards of product quality.

In fact, so concerned is the firm with quality that it actually makes its own paper from pulp, to control strength!

The same quality considerations led to Bloomer's choice of Cities Service Pacemaker Wax.

Nothing can ruin a carton manufacturer faster than customer complaints of wax in the contents. With Cities Service Pacemaker Wax, such a problem is unheard of.

Moreover, Cities Service Pacemaker Wax provides unusual temperature properties which permit slippage during manufacture and prevent cartons from sticking together during storage. "That, plus a hard, high-gloss surface, has been more than enough to sell us on Cities Service!" says Bloomer Brothers.

Like Bloomer Brothers, you'll find locally warehoused, conveniently packaged Cities Service Wax is best for your operation, too. Get the full story from a Cities Service Wax Representative. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

From Pulp to Package, Bloomer Brothers applies strictest quality control. The firm pioneered the "Spede-Pac Pail" with locking top for factory fill, and originated the "Peel-Pail"—first that could easily be peeled from its contents.

Cities Service Wax was choice of Bloomer Brothers because it never rubs off into ice cream, prevents cartons from sticking together, and gives high gloss. The wax is locally warehoused and available in one-ton carTONS.

PRICES OF FIBERS

MARKET WOOD PULP

THIRD QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$83.00/ 86.00§	§$92.00/ —	§$77.50/ 90.00
Kraft, Blchd.	152.00/155.00	155.00/ —	§155.00/ —		§155.00/ —
Kraft, Blchd. Hdwd.	150.00/ —		§137.00/ —		
Kraft, Semi-bleached	140.00/ —	135.00/140.00	§135.00/140.00§	*137.50/142.50	
Kraft, Unbl.	117.50/125.00	120.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	150.00/ —	150.00/ —	*150.00/ —	*150.00/ —	145.00/147.50†
Sulphite, Unblchd.	130.00/ —	130.00/ —	†130.50/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		129.00/ —	†129.00/ —		
Soda, Blchd.	142.50/145.00	145.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

New Domestic Cotton Cuttings
Delivered Mill Basis
PRICES NOMINAL

	Per 100 lbs.
No. 1 White Shirts	$13.50/$14.00
No. 1 Unblchd. Muslins	16.00/ 16.75
Blchd. & Unblchd. Underwears	15.00/ 15.50
No. 1 Light Silesias	7.00/ 7.50
No. 1 Light Blue Overalls	7.25/ 8.00
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.50
Suntan Khakis	5.50/ 6.25
Cottonades	3.25/ 3.75
No. 1 Washables	2.50/ 2.75

Old Domestic Cotton Rags

(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.00/$3.25
Cotton Pants & Overalls	2.00/ 2.25
Twos and Blues, Repacked	1.50/ 1.75
No. 2 Roofing	.60/ .70

COTTON LINTERS

Memphis Market
f.o.b. Oilmills

Week Ended September 16

Grade		For 100 lbs.
1	n.a.	
2		$9.50/ $9.25
3	1 cut—felting	8.75/ 7.75
4		8.00/ 7.00
5		7.00/ 6.50
6		6.00/ 5.50
7		5.50/ 5.00

*Based on 73% cellulose.

Old Rope & Bagging

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$5.75/$6.50
Scrap Burlap	4.50/ 5.25
Australian Wool Pouches	5.25/ 5.75
Gunny	5.50/ 6.25
No. 1 Domestic Manila Rope	7.75/ 8.25
No. 1 Foreign Manila Rope	6.25/ 6.50
Domestic Sisal Strings	4.25/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

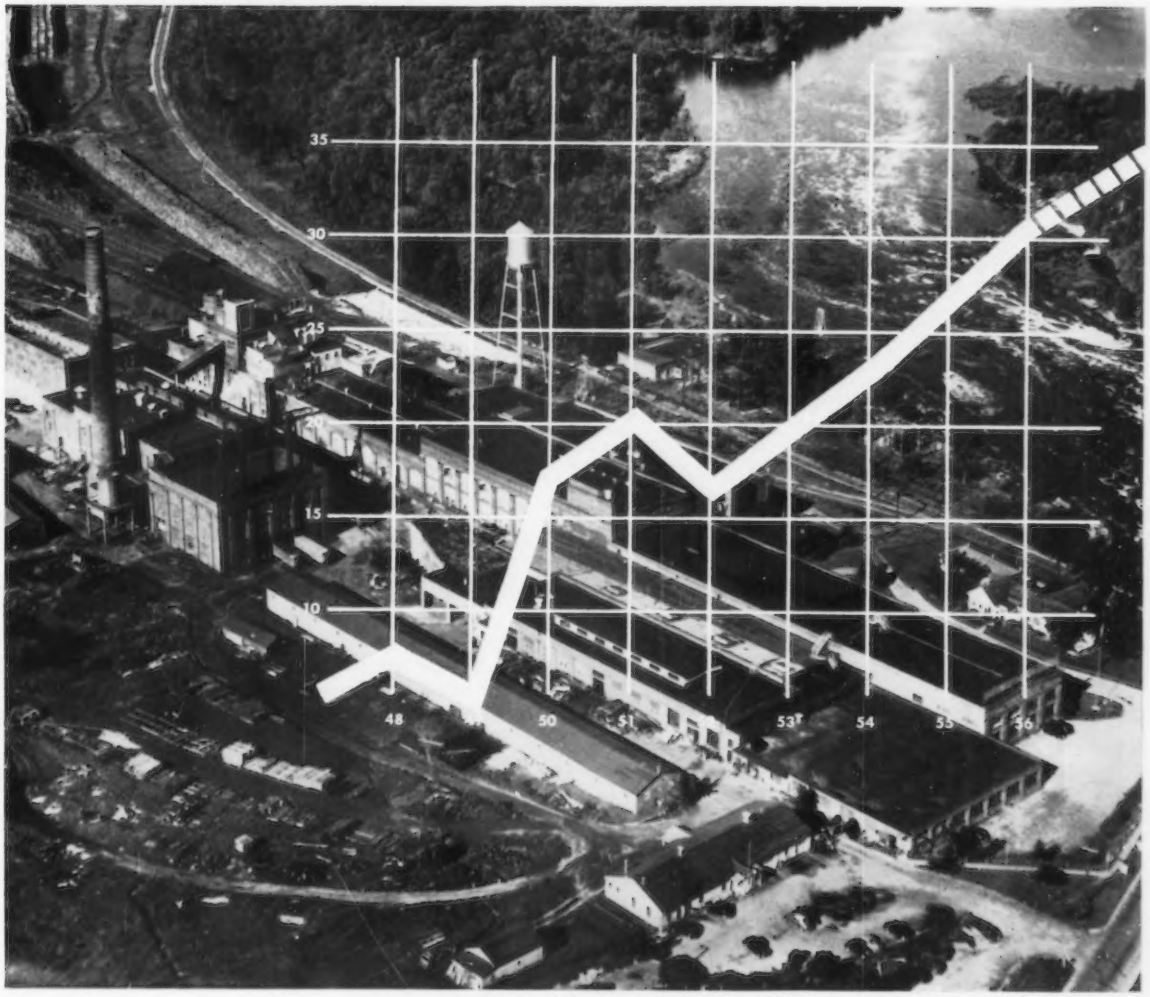
These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	September 16	September 16	September 16	September 16
No. 1 Mixed Paper	$4.00/ 6.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	11.00/ —	12.00/ —	11.00/ —
Overissue News (Lg. size)	13.00/ 16.00	14.00/ —	17.00/ —	13.00/ —
Mill Wrappers	11.00/ 13.00	9.00/ 14.00	7.00/ —	13.00/ —
Old Corrugated Containers	24.00/ 25.00	21.00/ 25.00	25.00/ —	18.00/ —
Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 36.00	30.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts (Semi-chem. medium)	25.00/ 30.00 40.00/ 45.00	35.00/ 40.00 45.00/ 50.00	35.50/ — 40.00/ 45.00	30.00/ — 40.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	40.00/ —
New Br. Kraft, Env. Cuts	65.00/ 75.00	70.00/ 75.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 30.00	22.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	45.00/ 55.00	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	60.00/ —	— / —
Super Soft White Shvs.	65.00/ 70.00	70.00/ 75.00	70.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/105.00	85.00/ —	85.00/ 90.00
Hd. White Env. Cuts	115.00/125.00	120.00/125.00	95.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 60.00	55.00/ 62.00	47.50/ —	30.00/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	49.00/ —
No. 1 Col. Ledger	30.00/ 32.00	30.00/ 35.00	40.00/ —	27.50/ —
White Ledger	50.00/ 55.00	50.00/ 55.00	55.00/ —	35.00/ 40.00
Mixed Book & Mag.†	18.00/ 20.00	19.00/ 20.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	22.00/ 24.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:		
coml. bulk, c.l. wks.	cwt.	$1.85 / 2.05
iron-free, c.l. wks.	cwt.	3.55 / —
Casein, acid prec.:		
dom. sh. pt. c.l. (30 mesh)	cwt.	56.00 / —
Arg. ex. dock	cwt.	22.50 /23.00
New Zealand	cwt.	25.00 /25.25
Caustic soda:		
c.l. wks. solid, 76%	cwt.	4.30 / —
flak. & grd. drums, c.l.	cwt.	4.70 / —
liquid 50% tanks		2.90 / 3.00
liquid 73% tanks		3.00 / 3.10
China Clay		
dom., dry-grd., airfloat:		
325 mesh bgs., c.l. Geo.	ton	10.00 / —
300 mesh, bgs., c.l. Geo.	ton	13.50 /14.50
imp., white, lump, c.l. ex. dock		20.00 /35.00
Chlorine:		
single-unit tanks, works	cwt.	3.15 / —
multiple unit, 2-5 cars per yr.		5.25 / 4.05
Lime:		
hydrated, bulk, c.l. N.Y.	ton	22.32 / —
quicklime, bulk, c.l. N.Y.	ton	20.82 / —
Gum rosin:		
K, M, N, drums, c.l. Savan,	cwt.	7.45 / 7.55
Rosin size:		
70%, gum & pale paste, tank cars, south, sh. pt.	cwt.	7.44 / 7.48
Saltcake:		
dom. bulk, 100% anh. wks.	ton	28.00 / —
Soda ash:		
light, 58% ash bags, wks.	cwt.	1.90 / —
bulk, c.l. wks	cwt.	1.60 / —
Sodium chlorate:		
tank-cars, wks.	cwt.	8.15 / —
drums, wks.	cwt.	9.00 / —
Sodium peroxide:		
dms., c.l. E. of Miss.	lb.	.20½/ —
l.c.l. (same basis)		.21 / .21½
Sodium silicate, 40° Be.:		
tank-cars, wks.	cwt.	1.20 / —
drums, c.l. wks.	cwt.	1.55 / —
47° Be. WW.		
tank-cars, c.l. wks.	cwt.	1.90 / —
drums, c.l. wks.	cwt.	2.25 / —
Soybean, protein:		
chem. isol., wks. c.l. bags	lb.	.23 / —
Starches:		
corn, multiwalls, c.l. prod. plant:		
pearl	cwt.	6.49 / 6.75
white, dextrins	cwt.	8.08 / 8.20
chlorinated	cwt.	8.25 / 8.35
potato, Idaho, c.l. wks.	cwt.	6.50 / —
East, fr. all. 50 cents cwt.		
potato, Maine, f.o.b. wks.	cwt.	6.25 / —
Sulphuric acid:		
60° Be. cbys. c.l. wks.	cwt.	2.00 / —
l.c.l. wks.	cwt.	2.45 / —
tank-cars, wks.	ton	18.60 / —
Sulphur:		
crude, c.l. mines, contract,	long ton	26.50 / —
f.o.b. vessels Gulf dock	ton	28.00 / —
Sulphur dioxide:		
liquid, coml. cyl., wks.	lb.	.10 / .12
multi-unit cars, wks.	lb.	.0535/ —
Talc, fibrous grd., bags:		
c.l. wks., N.Y.	ton	28.00 / —
l.c.l. wks., N.Y.	ton	31.00 /36.00
Titanium dioxide:		
anstase, c.l. dlvd. E. bags.	lb.	.25½/ —
l.c.l. dlvd.	lb.	.26½/ —
rutile, c.l. dlvd.	lb.	.27½/ —
l.c.l. dlvd.	lb.	.28½/ —



Westinghouse planned modernization helps you

GET MORE PRODUCTION

. . . be ready for tomorrow's demand

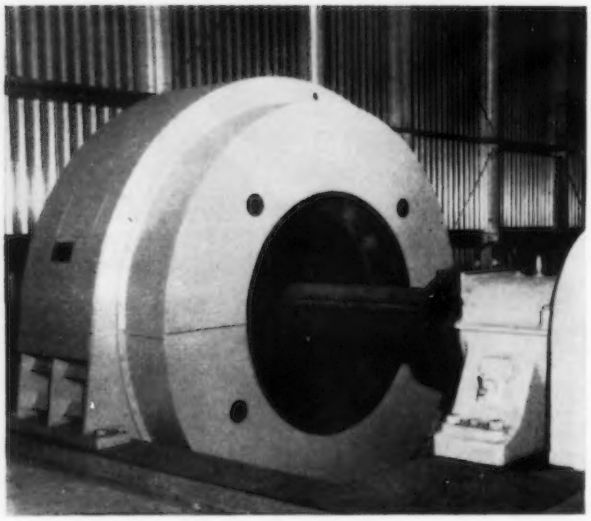
Production speed and reliability, plus top quality . . . these are among the major factors determining your future competitive status.

To meet tomorrow's demand, pulp and paper producers need to get more production from present equipment. The obvious way to increase the production of your paper machine is to increase its speed. However, to maintain maximum production, you must have maximum availability of your machines. Westinghouse experience and step-by-step modernization of paper mills can help you plan improvements with *minimum* downtime.

Tighten up operating efficiencies ——————→

YOU CAN BE SURE...IF IT'S Westinghouse

In the pulp room . . . WESTINGHOUSE MOTORS PROVIDE THESE THREE ESSENTIALS



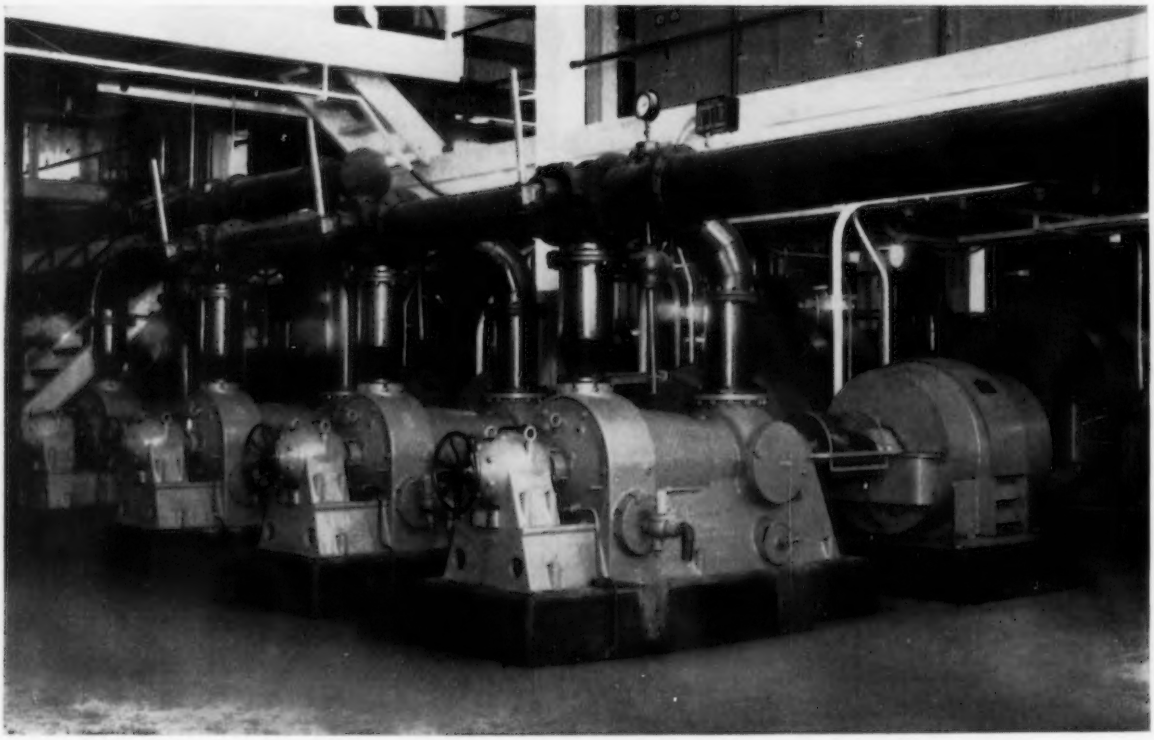
Specially designed and constructed to withstand abuse, Westinghouse grinder motors mean more protection, less downtime and more profit.

A battery of modern hydrofiners driven by 250 hp slow-speed synchronous motors. Westinghouse insulation improvements assure continuous power for dependable material flow.

1. Operation under severe moisture conditions
2. Uninterrupted service
3. Resistance to direct corrosive action of chemicals used

The most important recent development for motor drives is Westinghouse Thermalastic® Insulation.

Thermalastic Insulation ignores water, chemicals, dirt and other contaminants. Dielectric strength is increased 20 percent and tensile strength more than 30 times that of ordinary insulation. Thermalastic Insulation is extremely elastic and is often referred to as the insulation with a memory. It can be stretched for an indefinite period, and when the tension is released, will return to shape. This is an outstanding characteristic because insulation of Thermalastic will expand when the conductors expand and return to original shape when the conductors cool. Today, in industry, over one-half million hp in motors are protected with Thermalastic Insulation, and there hasn't been an insulation failure.



In the Machine Room revamp your paper machine drives with . . .

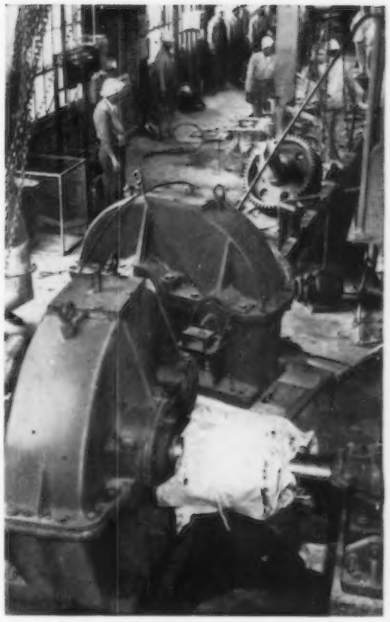
WESTINGHOUSE STEP-BY-STEP MODERNIZATION

You can gain substantial savings by planned modernization in the paper machine room. Systematic change-over on drive equipment can give you the availability you will need to meet future demands, plus these immediate benefits:

1. Higher speeds . . . increased production
2. Low maintenance — high availability
3. Additional dryers or new sections can be easily included with sectional drive revamps
4. Modern, completely automatic control with Magamp*, proved static regulating equipment

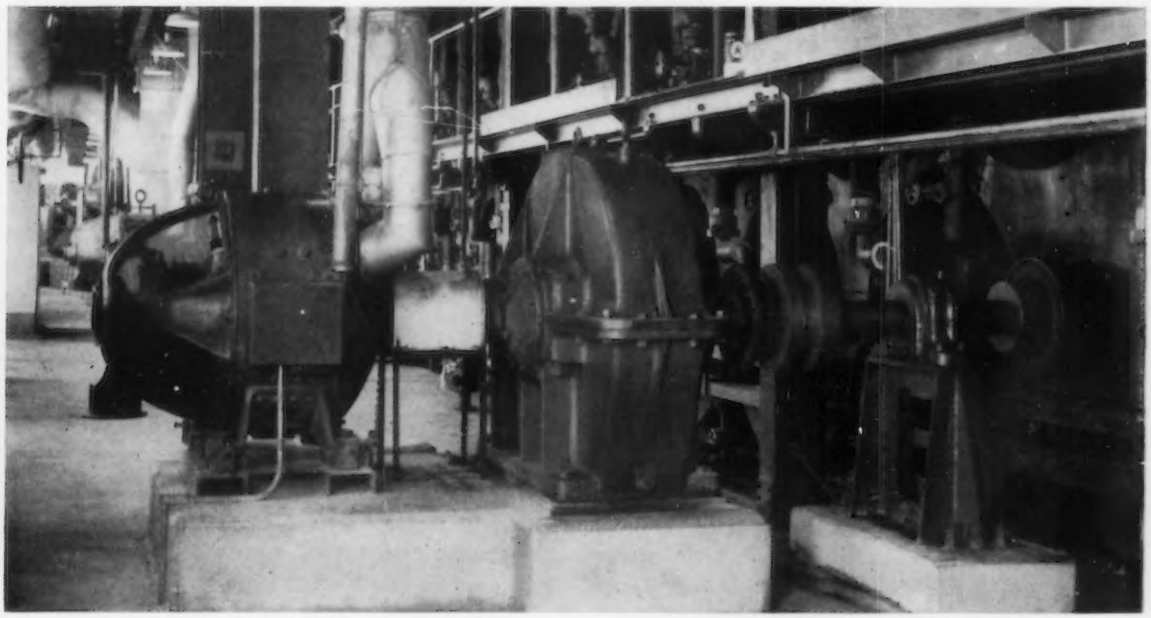
Every Westinghouse paper machine drive is engineered to your application. Each unit of apparatus is selected to meet the specific job requirements and mill conditions. Westinghouse sectional drives with fast-responding, dependable Life-Line® "H" motors and automatic Magamp control can deliver more tons of higher quality paper.

*Trade Mark



During revamp of a large southern paper mill, Westinghouse engineers stayed on the job around the clock to supervise installation of motors, gears, control and regulating equipment.

After complete modernization, line shaft area now permits efficient preventive maintenance inspections. Magamp regulation-of-drive cuts outage time and operating costs.

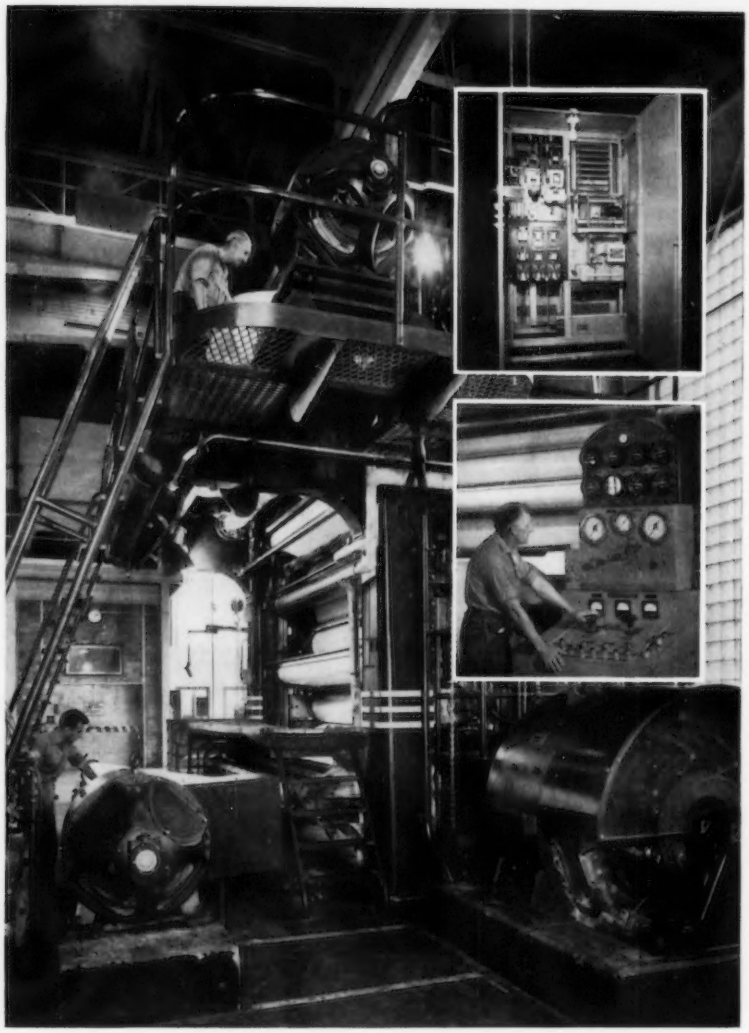


YOU CAN BE SURE...IF IT'S Westinghouse

Westinghouse offers integrated modernization→

rebuilt with Westinghouse equipment . . .

FINISHING OPERATIONS READY PAPER FOR MARKET . . . FASTER

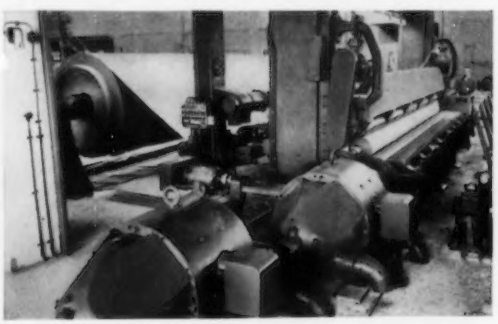


The modern Westinghouse supercalender drive effects precision control of the high-speed supercalender. This drive offers synchronization and close speed control of the main drive and windup stands. Thus it minimizes calender cuts or sheet wrinkles, assuring maximum production of uniformly wound, high-quality supercalendered paper.

Westinghouse control automatically synchronizes and stabilizes threading and operating speeds over the entire production range. Synchronization of drives maintains constant sheet tension between the supercalender and both the unwind and windup stands.

Let Westinghouse help plan your modernization now. Call your Westinghouse salesman or write Westinghouse Electric Corporation, 3 Gateway Center, Box 868, Pittsburgh 30, Pennsylvania. MP-3052

High-speed supercalender with electrified unwind and windup provides accurate, automatic control of sheet tension. Magamp panel-mounted inside-control cubicle (inset top right) has high amplification characteristics which make it an accurate, effective control device. Complete control of supercalender is achieved from one operator's station.

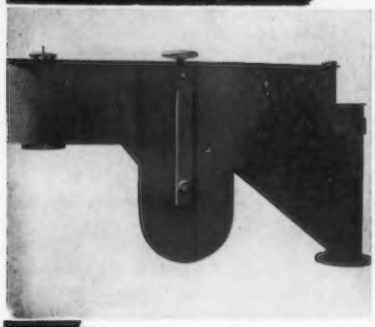


Modern two-motor winder drive permits uniform threading speed, smooth acceleration and deceleration between threading and productive speeds, minimizes off-quality rolls and reduces outages.

YOU CAN BE SURE...IF IT'S

Westinghouse

POIRIER
Counterflow



CONSISTENCY AND BASIS WEIGHT REGULATOR

Poirier's Counterflow Regulator is guaranteed to prevent basis weight variation regardless of incoming consistency.

To you, this means more uniform finished paper, quicker, easier and more economically.

Here's Why:—

- ★ Basis Weight controlled to within 2% plus or minus; consistency 1/10 of 1%.
- ★ Volume regulated even when stock is too light to be controlled by consistency.
- ★ No moving parts.
- ★ Outgoing consistency may be controlled to as low as .5%.
- ★ Operates on all tonnages and grades.
- ★ May be applied from knotters to paper machine.
- ★ Position available for attachment of part of Poirier Machine Variation Control.

Let our engineers study your operation and furnish you with complete details on how a Poirier Counterflow Regulator will help you as it has others. No cost — no obligation.

Write for full information

POIRIER CONTROL COMPANY
Waterville 1, Maine

Specialists in Stock Control Equipment

NEWS OF SUPPLIERS

G. Hannon

B. J. Koziol

H. G. Weber & Co., Inc., Kiel, Wis., has added Gilbert Hannon to its staff as project engineer. He has been with Weber since January, and formerly was associated with Schreiber Cheese Co., Green Bay, as plant and maintenance engineer and purchasing agent.

Black-Clawson Co. has announced that Bernard J. Koziol has rejoined the company as executive sales engineer to the Shartle Division, Middletown, Ohio.

He originally joined Black-Clawson in 1946. Since 1948 he has worked for St. Regis Paper Co. and Fibre Forming Div. of Arvey Corp., Olean, N. Y.

Beloit Eastern Corp., Downingtown, Pa., has completed an extensive expansion program which has doubled the company's facilities to approximately 200,000 sq. ft. Launched in January 1956, the program involved a new machine shop, erecting shop, pipe roll shop and the installation of new machinery.

General Aniline & Film Corp., has appointed Harold G. Shelton director of marketing for its Dyestuff and Chemical Division. James M. Cloney succeeds Mr. Shelton as sales manager of Antara Chemicals and John T. Robinson has been named to the newly created position of Director-Sales Administrator for the Dyestuff and Chemical Division.

Reliance Electric & Engineering Co. has established a branch office in Bangor, Me., with Norwood F. Joy as manager.

Other recent appointments include Merle K. Sieber as Charleston, W. Va., branch manager; John P. Landis as Appleton, Wis. branch manager; and Clayton Y. Goss as Dayton, Ohio, branch manager.

during the last 18 months

EXTREMULTUS BELTING

has been installed in

130

of the nation's leading paper mills

THESE ARE A FEW OF THE REASONS:

- Freedom from stretch eliminates take-up
- Widths a small fraction of the belts replaced
- Speeds up to 10,000 feet per minute
- Unexcelled shock and vibration absorption
- Ratios as high as 20:1 at contact arcs of 90°

for full details, write
EXTREMULTUS, Inc.
405 Lexington Ave., N.Y.C.

THE ACCEPTED STANDARD BRUSHES

BRUSHES
for
PAPER COATING
DAMPENING
POLISHING
FELTING
SPECIAL BOARD POLISHING

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P. O Box 774
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ENGINEERS

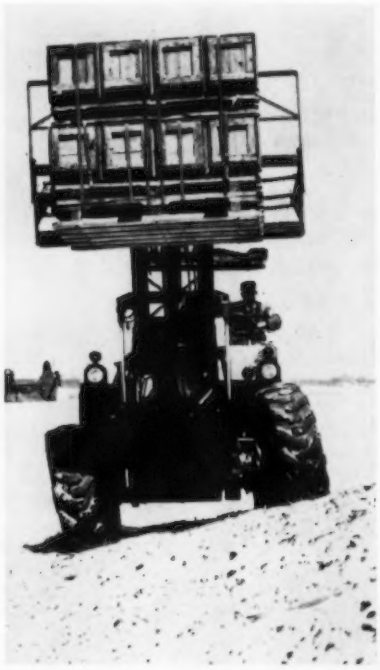
Process Studies, Design, Specifications and Construction Supervision

PULP AND PAPER MILLS

Steam, Hydraulic and Electrical Engineering Reports, Consultation and Valuations

80 Federal Street Boston 10, Mass.

NEW EQUIPMENT AND SUPPLIES



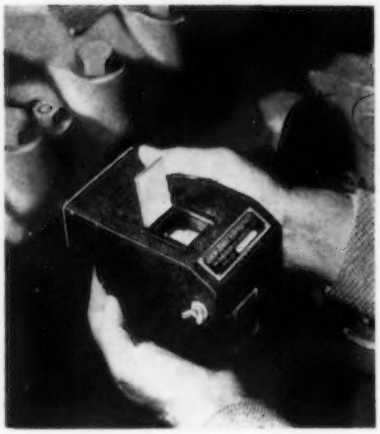
Army Shows Fork Truck

A fork-lift truck that pulls itself out of holes, drives sideways, reaches for its load and then holds the load on an even keel over any terrain has been unveiled by the U. S. Army Quartermaster Corps.

Officially designated a "rough terrain fork truck," but nicknamed the "Ranger," the machine is designed to move military supplies from landing craft to inland storage points under combat conditions. Other applications include handling materials on beaches, across snow fields and in similar areas inaccessible to conventional handling equipment.

Designed to Army specifications by the Industrial Truck Division of Clark Equipment Co., the Ranger has operational and mechanical characteristics unlike any found in conventional fork trucks. With both front and rear axle steering it can move sideways at a 20 degree angle. The body and forks can be tilted left or right, independent of the axles, to permit pick-up of loads set at an angle or to carry loads at a level across a hill-side.

Following the Army announcement, Clark Co. said that less spectacular but equally rugged commercial versions of the trucks are being manufactured for use in the lumber and related industries. Further information may be obtained from Clark Equipment Co., Industrial Truck Division, Springfield Place, Battle Creek 114, Mich.



Measures Amplitude, Frequency Of Vibration

The Davey Hand Vibrograph is a compact self-contained instrument for making permanent records of machinery vibration on a continuous paper chart. It measures amplitude and frequency. Wave forms are shown in the minutest detail. A salient feature is an instantaneous external adjustment which selects the degree of magnification desired, giving 40, 20, 10 or 5:1 ratios. No battery or outside power source is required. A carbon shod ball bearing probe is provided for taking measurements directly on the surface of rotating shafts. Manufactured by Vibroscope Co., P. O. Box 97, Glenford, N. Y.

LOCKWOOD GREENE
ENGINEERS

Services To The Pulp & Paper Industries

Plant location studies • Plant Design • Expansion
Design of power & steam plants • Water • Waste
Supervision of construction • Appraisals & reports

NEW YORK 17, N. Y. 41 East 42nd Street
BOSTON 16, MASS. 316 Stuart Street
SPARTANBURG, S. C. Montgomery Bldg.

Offer New A.C. Manual Autostarter

A new a.c. manual nonreversing autostarter (Type JF) is available from Westinghouse Electric Corp. for starting squirrel-cage induction motors from 5 to 125 hp. at 220 volts, and from 5 to 250 hp. at 440/550 volts. The unit is designed for use wherever across-the-line starting current of motors exceeds local power company restrictions or interferes with plant operations.

The JF autostarter is housed in a shallow, wall-mounted NEMA 1 general purpose enclosure, but NEMA 4 watertight or NEMA 9 class 2 group G enclosures are also available. The line has five sizes, numbered 2, 3, 4, 5 and 5L, according to horsepower requirements.

The autotransformer is of the two coil type, and is connected open delta. It meets NEMA standards permitting a cycle of one 15-second start in each four minute interval, for a total of four starts followed by a two-hour rest period. Transformer taps provide starting voltages of 65 per cent and 85 per cent of line voltage; starters larger than 50 hp. also have a 50 per cent tap.

Overload protection is provided by two MW bimetallic snap-action disc-type overload relays. All starter sizes use double-break silver alloy air-break contacts. Sizes 4, 5 and 5L have De-ion® arc quenchers on the start contacts for long contact life.

A new sequence and holding mechanism, which governs the starting sequence, positively prevents going to the "run" position without passing through the "start" position first. The mechanism opens the contacts in case of overload or undervoltage. The starter is held in the "run" position by a solenoid operated latch.

Modifications available include a time-delay undervoltage protection protection mechanism, an L-60 electrical interlock for operating external circuits and a cover-mounted ammeter. Remote emergency stop push buttons can be added to the local stop button included with the starter.

For further information, write Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

Develop 'Quick' Coupling From Rigid Pipe

A "quick" coupling that reportedly can be assembled and disassembled in seconds has been developed from high impact Koroseal polyvinyl chloride pipe produced by the plastic division of B. F. Goodrich Industrial Products Co., Marietta, Ohio.

The new coupling is recommended for temporary chemical, oil, water or disposal lines. It is said to withstand high pressures, and resist corrosion.

Quick coupling rigid pipe is available in 2-in., 3-in. and 4-in. sizes in standard 20- and 30-ft. lengths. B. F. Goodrich offers a variety of fitting adaptors, disassembly tools and replacement gaskets for easy use and maintenance in any installation.

Koroseal pipe is resistant to most acids and alkalies. In addition the high impact polyvinyl chloride material is unaffected by salt, oil, water, and alcohol solutions.

TOUGH

PAPER MILL AND SPECIALTY

CORES

WITH OR WITHOUT METAL ENDS

DURO RETURNABLE

RHINO NON-RETURNABLE

ECONOMICAL CARRIERS FOR—

• Newsprint • Wax Paper • Blue Print Paper • Fine Papers
• Cash Register and Adding Machine Paper • Cellophane • Tapes
OR any paper that can be wound on a core!

DURO Returnable Cores, with 3" to 6" I.D. Bermico Metal Ends, are made to take abuse on high speed presses. Also made in any diameter and length without metal ends. Proven superior. RHINO non-returnable cores supplied in sizes to fit your needs. Specialty cores from ¼" I.D. up, and ½" to 24' long. Write for free descriptive core catalog at no obligation!

SONOCO PRODUCTS COMPANY

MAIN OFFICE — HARTSVILLE, S. C.

MYSTIC, CONN. • AKRON, IND. • LOWELL, MASS. • PHILLIPSBURG, N. J. • LONGVIEW, TEXAS
PHILADELPHIA, PA. • LOS ANGELES, CAL. • GRANBY, QUEBEC • BRANTFORD, ONT. • MEXICO, D. F.

DEPENDABLE SOURCE OF SUPPLY

Announce New Felt Cleaner

T-743, a new concentrated, synthetic liquid, organic compound for cleaning melamines, clays, colors, pitch from felts is now being marketed by the DuBois Co., Inc., industrial cleaning compound manufacturers.

The manufacturer claims the liquid is new physically because it's a uniform, stable liquid unlike old alkali or acid mixes. It washes out fast because it rinses itself leaving no odor. T-743 will give a minimum of felt filling because of complete uniformity. Users have reported there is less rejected paper and a noticeable saving in labor cost and cleaning frequency.

T-743 is diluted in water without personnel hazard and used directly on the felts, without effect on any fabric or material. It is packaged in 15 gal. and 55 gal. drums.

More information may be obtained from DuBois Co., Inc., 1120-40 W. Front St., Cincinnati 3, Ohio.

Heavy duty, rugged design, high-grade workmanship throughout. MURCO smooth interior barking drum, provided with sprays, when specified, delivers cleaner wood, because the smooth interior minimizes bruising and brooming. True barking action comes from the friction of log against log, in a rubbing action. Barking is not due to a rough interior that only brooms the ends of the pieces. . . . Completely designed as heavy duty equipment. You can depend upon MURCO Plate-Shell type barking drum to operate efficiently with a low maintenance cost, plus the fact that it delivers cleaner wood which means cleaner paper.

Tell us the size, type of wood to be barked and production requirements . . . we will submit recommendations and complete proposal

D. J. MURRAY MANUFACTURING CO.

MANUFACTURERS SINCE 1883 WAUSAU, WISCONSIN

Improved Rider Type Pallet Truck

A new improved model of their rider-type low lift pallet truck has just been announced by Raymond Corp.

The changes incorporated in the 4000 lb. capacity unit include redesigned reach rods beneath the elevating forks, specially tapered fork tip for easy pallet entry, and additional grease fittings for fast and easy maintenance of all lever assemblies.

Features of the earlier model which allow the truck to right angle stack 48 in. pallets from a six foot wide aisle have been retained. The truck has three travel speeds in forward and reverse with a maximum of 4½ m.p.h.

Write to Raymond Corp., 191-155 Madison Ave., Greene, N. Y. and ask for Bulletin 850, Supplement 1 which describes the new model.

Resin Cement Designed for Simplicity

A new aluminum-filled epoxy resin compound, recently developed by Smooth-On Manufacturing Co., is being marketed in self-metering tubes to give additional convenience and economy in its numerous applications. Metalset A4, a resin-catalyst system, comes packed in two collapsible tubes. The proper proportions of resin and low-toxicity catalyst are accurately measured automatically by squeezing out identical lengths of each material from its respective tube.

Metalset A4 can be used as a smoothing and caulking compound, a patching material for metals, wood, plastics, and concrete, and a repair cement for leaking tanks, pipes, conduit and windows.

Metalset A4 is available in bulk, as well as in 10½ oz., self-measuring tubes, through any mill supply house, or from Smooth-On Manufacturing Co., 572 Communipaw Ave., Jersey City 4, N. J.

RESTIGOUCHE

BLEACHED SULPHITE PULP

•

for the manufacture of Cellophane, Rayon and Products of Paper

Restigouche
BLEACHED SULPHITE PULP

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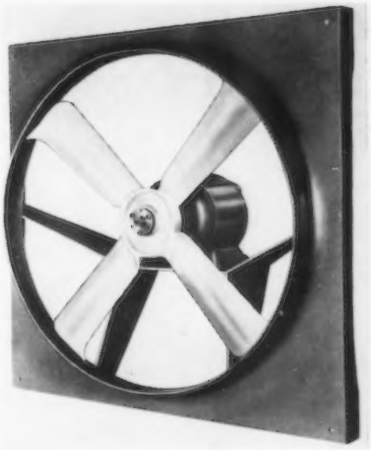

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New "LS" Type direct-driven fans, offering better performance in low static pressure ranges, are now being offered by the Aerovent Fan Co.

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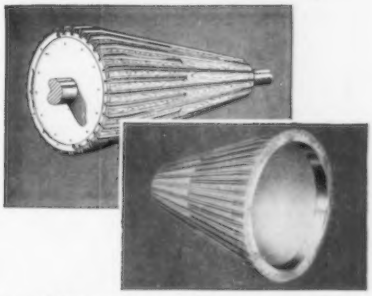

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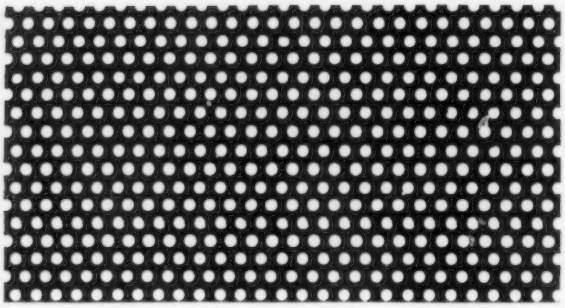

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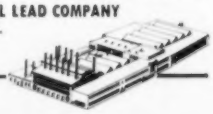

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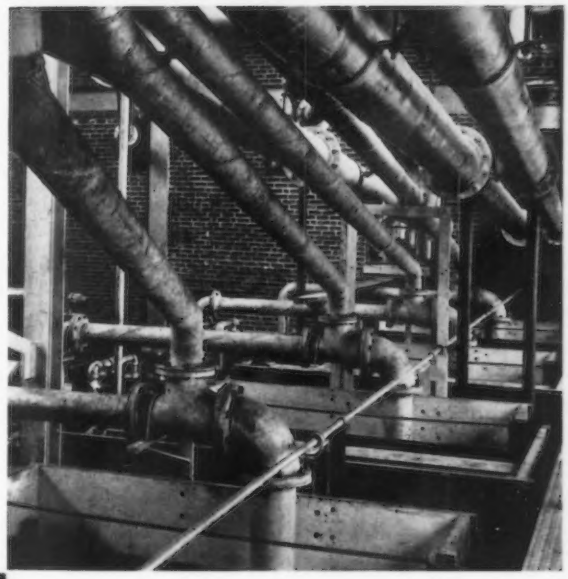

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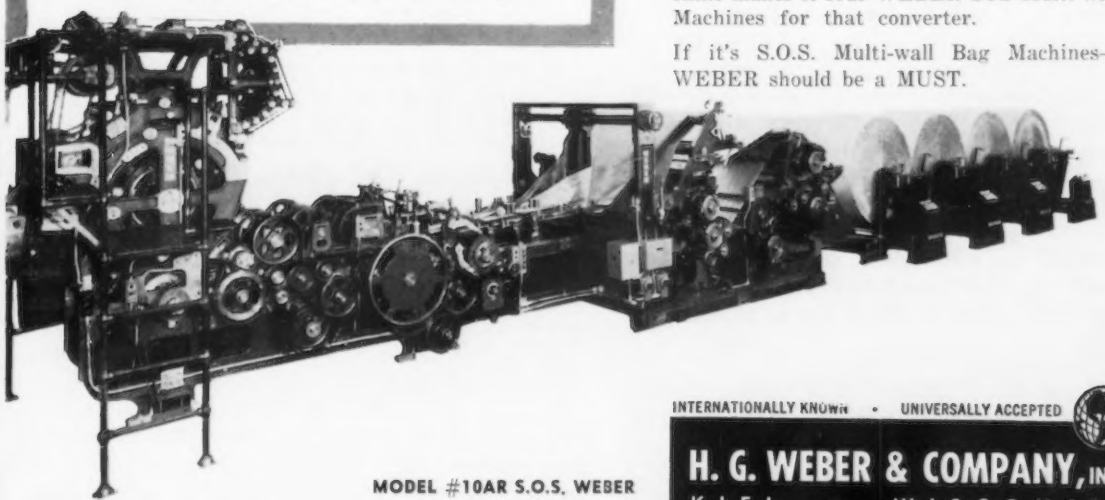

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60—36″ diameter x 84″ face, complete with frames, gears & bearings.
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4—28″ diameter x 80″ face with anti-friction bearing.
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50—Brass Felt Rolls, with Brass Journals, 72″ face x 5″ dia.

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1—750 ton hydraulic pulp press.

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8—sets (1 rubber, 1 chrome steel) 74″ face x 15″ dia., complete with bearings.

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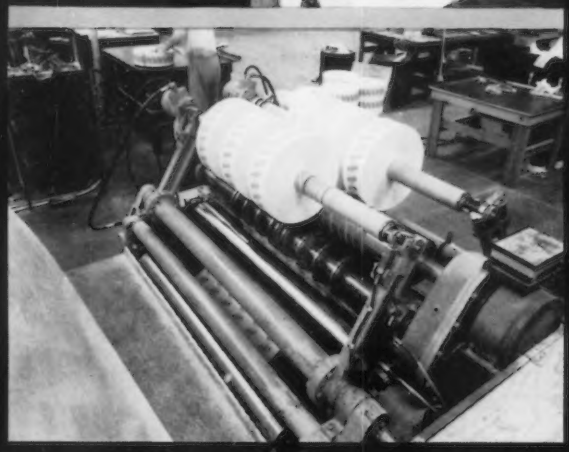

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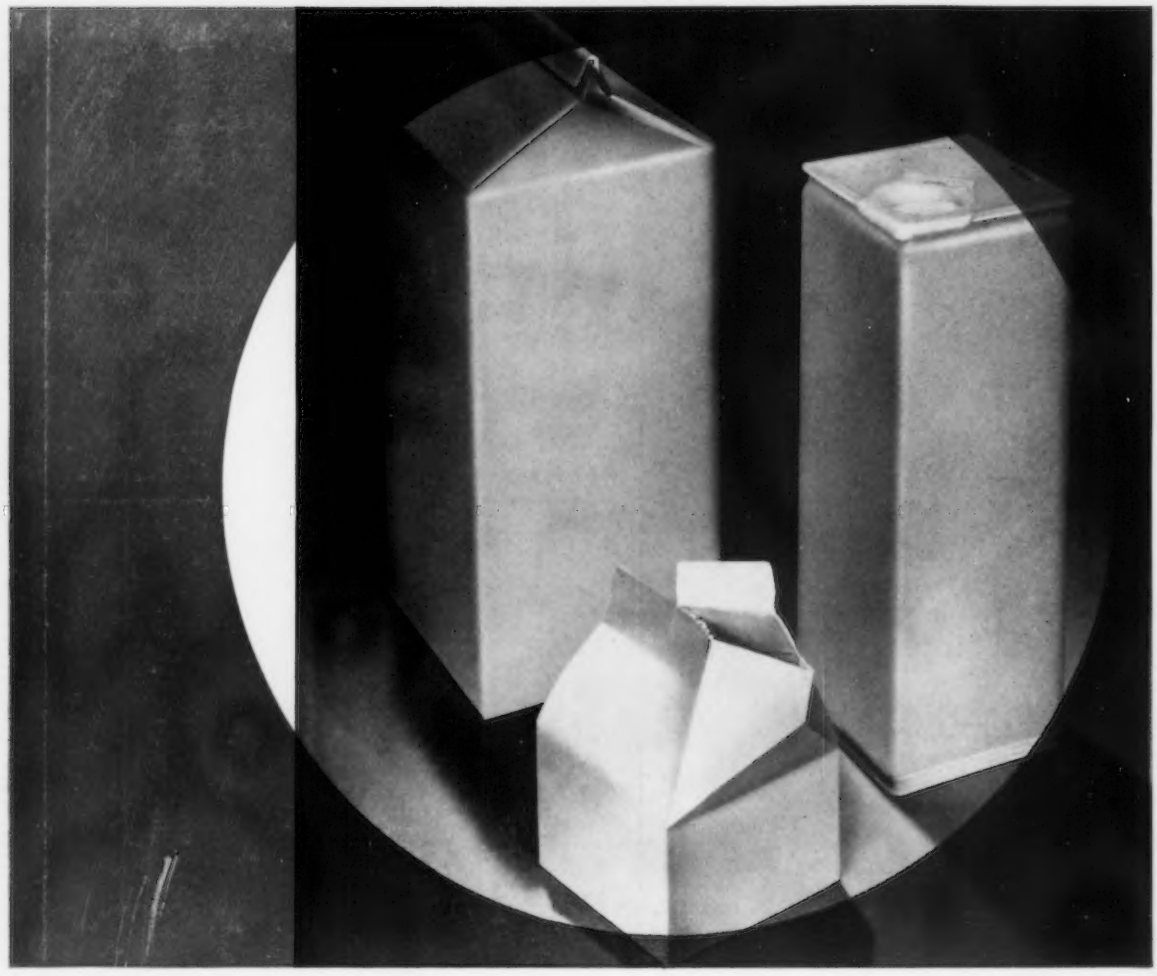

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